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By Lawrence H. Singer

Worried about Stockpiles—Estimates of metal supplies in Latin America, belonging to the United States Government, are in the neighborhood of 3½ billion dollars. This staggering stockpile is causing deep apprehension in the minds of many alert observers.

Writing in the New York *Times*, Charles A. Donnelly expresses the concern of many American businessmen over whether these huge supplies are to be stored permanently or declared surplus and resold. Included in the gigantic inventory are large quantities of tin, rubber, chrome, tungsten, nitrates, antimony, copper, cobalt and cinchona.

A related problem involves the future operations of industries organized in South America during the war to produce goods previously obtained from abroad. Included are factories equipped to manufacture hardware, steel, tires and many other articles. A tendency has been noted in recent months, south of the boarder, to increase tariffs and tighten imports, in order to protect these new industries from foreign competition.

Air Delivery — A new era in freight transportation was inaugurated some weeks ago when 6500 pounds of bedroom furniture were shipped from High Point, N. C. to Hartford, Conn. by airplane. In this revolutionary experiment, elapsed time was cut from four days to four hours!

The possibilities relating to the future expediting of heavy cargo are a bit breathtaking, when viewed in the light of this innovation. An important consideration is the fact that no crating was required for the test flight, and the merchandise reached its destination in perfect condition.

The cost of the 6500-lb. shipment was $650. Had the furniture been shipped by rail, the less-than-carload rate, plus the cost of crating and labor, would have approximated the same figure. As a matter of fact, the introduction of larger cargo planes in the next few years will undoubtedly bring costs down even further.

We are accustomed to thinking of the airplane as a suitable vehicle for swift transportation of perishable orchids or exotic tropical fruits. But apparently some interesting surprises are being planned for American industry by our aviation experts.

* * *

Mengel's Plans — Speaking of furniture, the giant Mengel Co. of Louisville, Ky., is starting to make shipments to dealers under the terms of its new merchandising program. This company anticipates an enormous expansion of its production and sale of branded bedroom and allied furniture direct to retail stores.

Franchised dealers will be sold direct from factory at fair-trade minimum sale prices. All designs

(Continued on page 7)

will be exclusive and carefully pre-tested. A really ambitious promotion campaign in this connection is about to be inaugurated.

The Mengel Co. will feature "permanized" furniture. Outstanding attractions will include modern plastic bonding throughout; lustrous, hard finishes, and exclusive "Permaslide" drawers which will slide freely under any atmospheric conditions.

* * *

Difference of Opinion—A free-for-all discussion of trends in industrial design provoked a wide divergence of opinion in New York not long ago, at a meeting held in the quarters of the Architectural League. One speaker defined streamlining as the design of the future; another guest declared that it is "the last futile brain-throb of a designer too lazy to strive for a genuine functionalism."

Even a discussion of the status of wood brought an exchange of angry words. While one expert declared that lumber is succumbing to the onslaught of metals and plastics, another commentator insisted that wood is "about to enter a renaissance of untold brilliance."

* * *

Trends in Design—As a footnote to the foregoing item, we ought to quote a statement made by W. W. Dodge, new products editor of *Business Week*.

"There may be, and undoubtedly are, radical new designs and radically new uses of new materials on the drafting boards and in the test laboratories of the nation," he declared, "but they have yet to meet the coldly critical inspection of the distributor and ultimate consumer."

(Continued on page 8)

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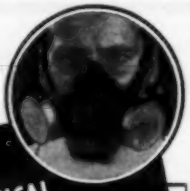

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Controlling Costs—A word of warning on the expected building boom has been sounded by William H. Shaw, chief of the Commerce Department's construction division statistics unit. Unless manufacturers, dealers, builders, management and labor all work together to keep costs within reason, he reminds us, the high goals anticipated by many forecasters will not be realized.

"Buyer resistance and economic uncertainties might cause a loss of as much as half a billion dollars in 1946 construction volume," declares Shaw. "Our forecast assumes reasonable costs — close to present levels—and it assumes the internal cooperation of all segments in the industry."

Commenting further on possible dangers, this government expert points out that there must be a minimum of bottlenecks in the supply of both materials and labor. "In short," he concludes, "we assume that the construction industry will do its share of reconversion—and do it well."

* * *

Prices Going Up—If all controls are abandoned, says Dr. Charles Wardwell of the International Statistical Bureau, prices may rise as much as 12% to 15% this year. On the other hand, he contends, if we continue to keep strategic checks in force, the 1946 commodity price level should not go up more than 6% or 7%.

In his opinion, there are many reasons why an upward trend cannot be halted. First, there is a tremendous accumulated demand for civilian goods. Furthermore, distributors and manufacturers in many cases will swell the demand by placing replacement orders over

(Continued on page 137)

New materials and technique were used to condition all metal surfaces and build up a glassy smooth durable coating on the Shooting Star, to help make possible its amazing flying speed.

BY FRED M. BURT

the Shooting Star ☆☆☆

THE SUPER-GLOSS "grand-piano" finish on Lockheed's P-80, "Shooting Star," is but a preview of the aircraft surface smoothness that will be adopted as standard when 500-mile-per-hour speeds become common; and new top speeds approach the speed of sound—about 750 miles an hour at sea level.

This superfast jet-propelled plane can fly through the air in level flight at close to 10 miles a minute, when its General Electric super jet-propulsion turbine is spinning at more than 10,000-r.p.m. It has a wing span of 38-ft., 10½-in., an overall length of 34½-ft. and a height of 11-ft., 4-in., with a total weight of approximately 8000 lbs. (empty) and 14,000 lbs. with maximum fuel capacity.

Some of the high speed and overall efficiency of the P-80 is made possible by its new type of glistening exterior finish, according to Clarence L. Johnson, Lockheed's chief research engineer. Mr. Johnson declares that, "The terrific speed of the Shooting Star made it necessary for us to take an entirely new approach to problems of surface smoothness. Flush riveting and clean, aerodynamic lines were sufficient for good operating characteristics in planes with top speeds as high as 425 miles an hour. However, the Shooting Star, with its much greater speed, presented new problems of air resistance."

Rivets with as little as .002-inch variance from being absolutely flush with the plane's skin, affect

★ Power buffing the waxed surfaces to give them mirror-like smoothness.

Above: New fluids for cleaning and etching are applied to the surface.

Below: Applying the new type putty that remains flexible when dry.

the speed, maneuverability, and efficiency of the Shooting Star in normal flight. Accordingly the protruding rivets are cut down and the surface is ground to this fine precision fit. In low speed planes this would probably make little difference. Smoothing rivets and surfaces of a 400 mile-per-hour fighter would probably increase its maximum speed by as much as 10%. But the Shooting Star, which cruises faster than this—faster than top speeds of conventional fighters—enters a range of acceleration where surface smoothness takes on vital importance.

Streamlined Contours, Plus Smooth Glossy Surfaces

Aerodynamic lines of the superspeed plane are so clean and highly streamlined that they eliminate even the smallest variance in skin surfaces. Drag in conventional planes comes from exterior engines, radiators, and shutters which necessarily break aerodynamic lines. Additional resistance set up by rivets which are slightly over or under "flush," amounts to but a very small percentage of the total.

In appearance the Shooting Star's sleek, neutral gray coating compares to that of an expensive automobile. In composition and application, however, it is much different from conventional metal surfacing. Weathering resistance is higher, hardness is increased, and reaction to sudden changes in temperatures is minimized.

In normal flight at high speeds, leading edges of the Shooting Star's wings may reach a point 60° higher than surrounding temperatures as the result of air friction. Again, at extremely high altitudes (the plane has a ceiling of over nine miles) this same surface may be subjected to temperatures 60° below zero.

Developed by Lockheed research engineers, in cooperation with several of America's largest paint companies, the Shooting Star's paint job is highly complex in nature and still secret in detail. It incorporates newly developed cleaners, fillers, putties and surfacers. New devices for application of the finish have also been developed. Spray guns, pneumatic polishers, drying devices, and smoothing machines are each specifically designed to operate with the new type materials.

11 Important Steps in Super-Finishing Schedule

Application of the P-80's finish involves 11 steps—after all rivet heads, fasteners, and seams have been ground to a smooth surface. They are as follows:

1) Cleaning. New fluids for both cleaning and etching are applied to the plane's surface.

2) Puttying. Seams and rivet counter sinks are filled with a new type of putty which is flexible when dry, and has extremely high adhering qualities.

3) Sanding. Dry putty is wet sanded until the surface is glassy smooth.

4) Prime coating. Zinc chromate primer is the conventional type of primer used on the Shooting Star's surface.

5) Drying the prime coat. Primer is dried by infra-red heat lamps mounted on brackets that closely follow the plane's contour.

6) Surfacer coating. The equivalent of five coats of surfacer is sprayed over primer and taped seams.

7) Baking the Surfacer. The surfacer coating is subjected to 30 minutes of 125° heat to give it a hard, tough finish.

8) Sanding. The surfacer coating is smoothed with pneumatic

Wet sanding the baked surfacer coating, using a fine grade of sandpaper.

After being waxed and buffed the shiny surfaces have a mirror-like smoothness.

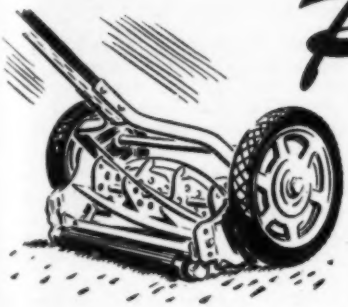
wet sanders, using an extremely fine grade of abrasive paper.

9) Lacquer coats. Three coats of special lacquer are applied by a new spray process.

10) Bake Lacquer. Final drying includes another 30 minutes at 125° F. All 125° F. heats are applied in special ovens that are large enough to hold the entire plane. Close controls help to maintain perfect control over the heat and humidity within the oven—and to assure clean air by ventilation.

11) Waxing. The final extreme smoothness is obtained by the application of a special wax and a final buffing. The result is a genuine mirror-like surface, as can be seen in one of the pictures with this article.

"Surfacing the Shooting Star as we do," Mr. Johnson states, "is not a 'cure-all' for exceeded tolerances in manufacture. Basically the plane must be built with an unusually high degree of precision—much higher than was ever necessary before. Surface coating of aircraft, of course, is not new. Heretofore the surface finishing was largely for appearance only, but in the future it will be considered an important factor in actual operation."



Painting Lawn Mowers

BY JEAN J. TARTTER

Question: *Have you any data or articles in your file in regard to the production finishing of lawn mowers?—A Reader.*

Editor's Reply: *It so happens that we have such an article now on hand, and here it is. The author of the article was formerly in charge of metal cleaning and painting in a large lawn mower factory in New York state. He has had his article checked over and okayed by the superintendent of that plant. Unfortunately no suitable pictures are available at the moment for illustrating it, as the company is making further changes in its production setup.*

THE FACTORY I have in mind turns out several hundred thousand lawn mowers every year, all of them attractively painted in various colors. The line includes hand mowers, power mowers and horsedrawn mowers.

Let us start with a hand lawn mower, where it leaves the assembly line and arrives in the paint department. Formerly these mowers were piled on trucks, each holding 35 to 50 units, and rolled alongside an automatic washing machine. When assembled mowers reached this point they were more or less covered with machine oil, emery grit and shop smudges. They were fed into the conveyor chain belt of a washing machine of the tunnel type. They moved along between sprays of hot cleaning solution; then through a clear hot-water rinse. A workman replaced them on a waiting truck and moved them to a spray booth.

The new method adopted by the company does away with the labor of loading and unloading these trucks, and eliminates the continuous use of live steam and caustics. It is as follows:

Small Units Cleaned in Spray Degreaser

The completed mower passes through a tunnel, between sprays of degreasing spirits. These sprays of solvent cleaner strike it with considerable force from all directions. A conveyor carries mowers through the spray cleaning tunnel and for a distance of about 50-ft. beyond. The 50-ft. of travel between the cleaning tunnel and the first spray booth allows time for the degreaser solvent to evaporate so the surfaces of mowers become dry. *(Continued next page)*

All motors under the tunnel, as well as those at the spray booths, are enclosed, and they are sparkproof, to help reduce the fire hazard to a minimum.

Most of the degreasing spirits that pass through the spray tunnel are caught and pumped through strainers for re-use. The only loss is what occurs by dragout and evaporation.

Quick "Blow off" with Air; Prime Coat; Color Coat

At this point the actual painting begins. The spray man mechanically lifts a mower from the conveyor and blows it with his air gun to make sure that it is completely dry and clean. He sprays on a coat of zinc chromate primer, and then places the mower on a truck where it remains while the prime coat dries.

A coat of synthetic enamel of the desired color is sprayed on, and the mowers are again placed on trucks to dry. Painted mowers move on to the decorators who add the trim color, striping, etc.

Next comes the inspection department where rubber tires are put on. The unit is adjusted and any places that need it are touched up by a finisher. Up to this point all of the work is so synchronized as to complete two mowers every minute.

Masking Technique; Striping; Final Touching Up

Most mowers have steel tie rods. In order to permit easy handling, these tie rods are left without the finishing coat until the last of the finishing operations. Other mowers have chromium plated tie rods which must be masked while the remainder of the mower is being painted. The plated rod is covered with a piece of 2-braid ¾-in. garden hose, cut to proper length, slit lengthwise, and slipped over the rod. These masks of split hose last a long time — several years in fact — and are a big saver of time and masking tape.

Finishers clean each tie rod, check over the mower for drips, skipped places, etc., and then put on the trim colors, striping and ornamentation. Mowers that have unplated tie rods are now finish-coated.

The iron wheel treads receive a coat of combination iron filler and blue lead which are broken up in turpentine to make a paint of fairly heavy consistency. This blue-gray paint is put on as a final "clean-up" coating, and it stands up well under severe handling. After the mowers leave the paint department they are run on rollers under conditions closely akin to actual use on a lawn.

At present, because of the shortage of suitable material for wood handles and rollers, all hand mowers are provided with tubular all-steel handles. These are cleaned and sprayed or dip-coated and hung on racks to dry. Later, when conditions will permit it, the company plans to return to its former custom of supplying wood handles with steel bales, to save weight.

Bales for Wood Handles Are Dip-Coated in Multiple

Each wood handle is provided with two steel bales. The steel bales are usually ¼-in. thick, 1¼-in. wide and from 14-in. to 30-in. in length. All are cut, punched, tumbled and bent to proper form before painting. They are cleaned by the same method as described for hand mowers. They are dip-coated with primer 50 at a time—with apparatus especially made for this purpose—and then hoisted up and allowed to dry. The drying period may range anywhere from

four hours to overnight. Then they are dip-coated with lacquer enamel of the color desired and again hoisted up on the rack to air-dry for two hours. Finally, they are striped.

Through experience and experimenting, the paint department has determined what materials and conditions are best suited for this work. This includes particularly the proper viscosity of paints for dip coating, the correct uniform temperature of the room, and the prevention of direct drafts of cold or cool air.

The striping of bales, as well as all striping on other parts, is done by hand. Mechanical devices seem to be too slow for the production schedules.

Painting Spare Parts; Repainting Used Mowers

Throughout the year many spare parts are painted, all substantially as just described in the hand mower schedule. During the year many machines of this company's make, and others—perhaps as many as 2,000 in a season—are repainted.

Used mowers to be repainted are first sent to the stripping tanks where all dirt, paint and, as far as possible, all rust are cleaned off. They are repaired and sent to the paint shop where they go through the same schedule as new machines.

Cleaning and Painting Power Mowers

The painting schedule for power mowers varies somewhat from the hand mower schedule. New machines come to the paint department without motors. They are assembled on large turntables, rolled onto portable benches, and wheeled into a steam room where they are sprayed all over with a mild cleaning solution. Next comes a hosing with live steam at about 75-lbs. pressure. This treatment washes off the oil, emery dust, and mill dust—and incidentally it warms up the metal so the wet surfaces will dry quickly. If the mower has rubber drive rollers or rubber tires, these are masked with masking paper and masking tape.

Power mowers, when cleaned and masked, are sprayed with a primer coat and allowed to dry. Then they are sprayed with a synthetic color enamel. Expert finishers do whatever striping, bronzing or other decorating may be required, including the application of decals. The final job is touched up where necessary and the mowers are returned to the assembly department for the mounting of motors, installation of electrical equipment, and final testing.

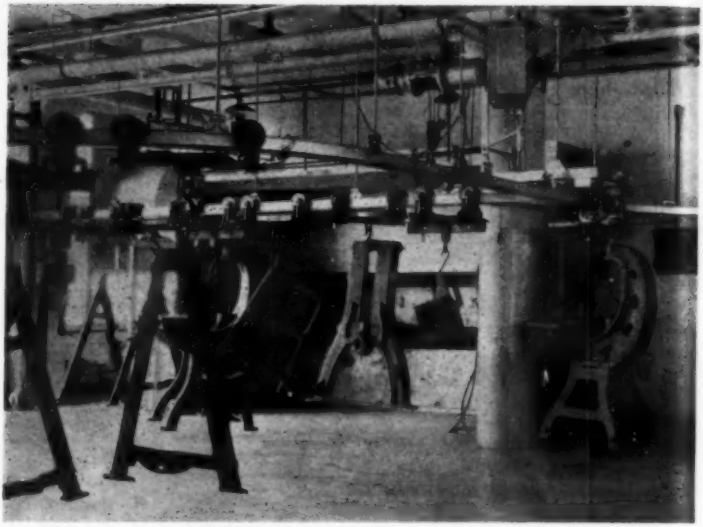
In those cases where the motor is attached before painting—usually on repair jobs or repaint jobs—the cleaning is more "severe," and more masking is necessary to protect magnetos and other electrical equipment. The painting schedule is the same as has just been described.

Several other pieces of related equipment are made such as sickles, bar attachments, grass catchers, gang unit frames for tractor use, and various gadgets such as lawn sprinklers, etc. All brass work is buffed and coated with clear lacquer. Other metal parts are painted as described in previous paragraphs.

Iridite Combats Corrosion

Rheem Research Products, Inc., 2523 Pennsylvania Ave., Baltimore 17, Md., offers to send free test panels to show how its product, "Iridite", protects zinc and cadmium plated surfaces from corrosion. The Iridite protection can be applied by dipping (15 to 60 seconds) followed by drying. An Iridite coating serves as a good paint base.

Our Planned Setup for



This view shows loaded carriers and some of the overhead trackage in front of a sanding booth which has a waterwash exhaust system.

SOME FEW YEARS ago I was engaged by one of the large manufacturers of machinery in the east, as a Consulting Finishing & Industrial Engineer. At that time this concern was using antiquated methods in painting their products. For example, all castings were brush painted after the machining operations.

Iron castings for their machinery products were classified under two types: 1) heavy work, and 2) medium and light work. Castings classified as "heavy work" were either pickled or tumbled to remove the dirt, sand or graphite left from molds; and those castings termed as "medium and light parts" were either tumbled or sandblasted. The method used depended on the fragility of the casting.

Small castings were set aside until a molding order was finished. Then the snagging operation was performed. Heavy and medium castings were snagged immediately after cleaning and then stored outside for an indefinite period, ranging from one month to a year. This practice originated when the storage of castings outside was considered essential to properly "cure" them.

During the period of outside storage iron castings accumulated a heavy coat of rust. Eventually the rusty castings were delivered

Painting Machine Parts

Slow, costly hand methods were being used. Then a careful survey was made. Recommendations specified: 1) a complete rearrangement of departments; 2) installation of overhead tramrails, carriers and hoists; 3) improvement in foundry practice to produce smoother castings; 4) the installation of mechanized equipment such as portable sanders, waterwash spray booths, power dip-coating, and ovens; 5) the adoption of all new materials for the streamlined painting procedure.

to the shop for machining operations, after which a heavy slush coat of grease was brushed over the machined surfaces, and the castings were again placed outdoors to be held in storage until the paint department called for them. Sometimes they entered the paint department covered with snow and ice. In such cases they were sprayed with steam.

The slush coat of grease was removed, or an attempt was made to remove it, by using wiping rags saturated with varnolene. Naturally this crude method of removing grease did not produce a thorough cleaning job. It left a thin film of grease and solvent spread over the entire surface. The next operation was to remove (some of) the surface rust and dirt. Men with hand wire brushes worked at this. Most of the loose rust was removed, but a considerable amount of close-to-the-surface rust always remained.

Operations that followed included filling with a spot filler, applied in most cases by the fingers instead of with a knife or squegee. Next a coat of brush filler (a very porous type) of heavy consistency was applied; and within an hour a second coat of a medium consistency filler was brushed on. Finally a third coat of a light consistency filler was brushed on. Then the castings were left to dry over night.

Next morning the coating of filler was sanded with heavy emery cloth. The filler, being of a very porous type, sanded freely with little effort. This sanding produced considerable dust which was blown off or brushed off into the factory atmosphere.

BY C. RAYMOND SYER
Consulting Finishing and Industrial Engineer

Following the sanding operation, the first coat of oil-base enamel was applied and allowed to air dry for one hour. Then a second coat was applied and allowed to air dry before the castings were transferred to the assembly floor. In most cases the time allowed for drying the enamel was inadequate, and often the finish became badly marred by handling when delivered to the assembly department.

When a new machine was completely assembled the damaged places in the paint job were

patched up with spot filler and given a coat of enamel. The patching work was expensive because, in most cases, it called for a complete cleaning of the machine with solvents, a careful sanding of the marred surfaces, a coat of filler followed by more sanding, and finally one or two coats of enamel.

The procedure just described was used chiefly on those castings which, when the machine was assembled would be located in the "eye zone"; these included the larger and medium size parts, such as heads, columns, bases and a few of the smaller parts such as handles, guards, etc.

On the larger percentage of small parts, not more than one of two coats of enamel were applied, and these were brushed over rust and oil or grease. The paint was allowed to dry overnight. Bright machined surfaces were given a brush coat of oil to prevent rust from attacking them during storage and shipment.

On a few of the small machines (bench type) a baking enamel was used. The first coat of enamel was baked for 15 hours at 250° F. and the second coat was baked for three hours at the same temperature. The surfaces were lightly scuff sanded between coats.

Small parts are placed on trays which fit into multiple-deck racks; the racks are moved by overhead carriers guided and supported by I-beam tracks.

Possibly there are concerns who are still using some of the methods just described. If so, I feel sure that the following corrective procedure will be of interest.

Scope of My Survey; A Completely New Setup

I was directed to make a survey and present my findings and recommendations in report form. This required a thorough study of the company's manufacturing procedure, and the planning of a proposed setup whereby the best possible equipment, materials and methods could be adopted to produce a better finish at lower cost.

The proposed setup provided for duplicate equipment throughout—for cleaning, spraying, dipping, brushing, and baking—therefore it offered continuity of production under all contingencies.

In recommending the proposed equipment and materials, all precautions for safety were taken into account. We considered fire hazards, explosions, and the health of all employees. Fire underwriters and insurance companies passed on all equipment and materials to be used.

In considering new methods and equipment, my objective was to eliminate rust and to do away with brushing methods as far as practicable; and further, to adopt more modern methods for cleaning, spraying, dipping and baking in order to get a more desirable and durable finish at a lower cost of production.

Smoother Raw Castings Reduce Cost of Painting

The first step was to install a modern abrasive blast-cleaning room in the foundry, and to discontinue the pickling operation. The next step was to find out if we could produce smoother castings in the foundry. This phase of the survey was discussed with the foundry superintendent and his associates. We found that we could get a greater degree of smoothness by insisting upon better upkeep of the patterns, more careful control of the molding sand, and proper supervision of molding and snagging operations.

Close-up of heavy casting in water-wash booth where the filler coating will be sanded to a smooth surface. Portable power-driven sanders are used to sand all surfaces that can be reached with the machine.

As a result of producing smoother castings, we were able to omit the filling operation entirely on some castings, while on others filling was reduced to a minimum. This was accomplished without slighting the smooth professional appearance of the finished machines.

Priming to prevent formation of rust during storage was next in

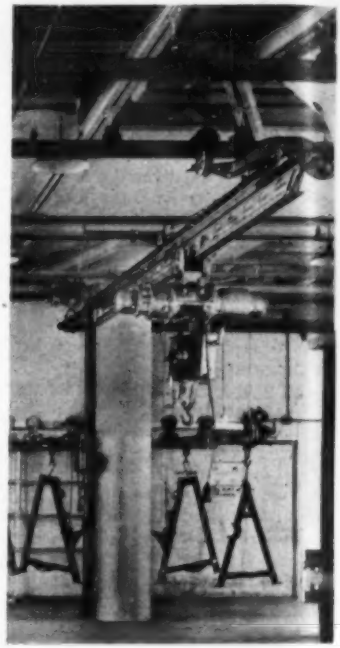
line. At this point, representatives of several paint manufacturers were asked to submit a rust-inhibitive material that could be sprayed on, and which would protect the surfaces against rust for at least one year. A temporary spray booth was set up and, as samples were received, castings to be stored outside were given a prime coat.

Finding and Selecting A Rust Inhibitive Primer

Our laboratory maintained a complete record of its analysis of the materials submitted. Each manufacturer's samples were given a number. The number and date used were marked on a tag which was attached to the casting, and this record was maintained for identification. The castings were then placed outside and periodical examinations were made to determine the rust resistance and other qualifications of the respective paints.

We were able to procure the type of primer we wanted from several sources of supply, and we adopted as standard practice the spraying of a rust-inhibitive primer over all castings to be stored outside. This primer coat provided better adhesion for succeeding materials, and it helped to give us a more durable finish. It also eliminated those clouds of rust dust which formerly filled the shop atmosphere when rust was being brushed from seasoned castings.

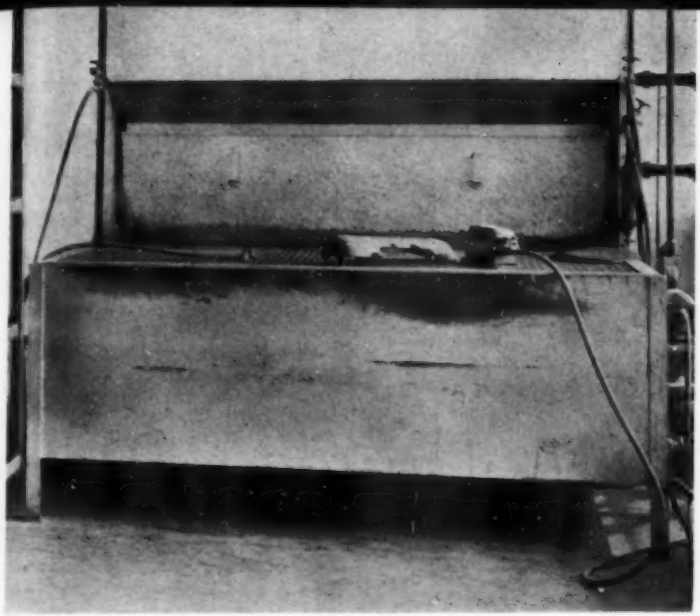
It was not practical to use any one method of applying the various coating materials to all types of machine parts. This was due to the numerous variations of shapes, the nature of the machining operations, and the variances in the percentage of surface to cover. We found that the method of painting would depend entirely upon the type of part to be painted. From experiments made during the survey it was learned that approximately 65% of the castings could be dipped, 25% could be sprayed, and the remaining 10% had to be brushed.



Notice overhead traveling electric hoist supported by a traveling beam.

Painting Before Machining Offers Real Advantage

We built two portable dip tanks, one for the primer coat and the other for the enamel coat. Several types of hooks were designed to take care of hanging the various shaped castings. More than 100,000 (1200 different types) castings were dipped or sprayed before machining. All parts were inspected after machining to check on the



This waterwash sanding table is topped with heavy wire mesh. Sander dust is promptly and effectively removed by an exhaust system.

condition and appearance of the paint job after the various machining operations were completed. Foremen were asked to give a report of complaints or difficulties that occurred during machining—such as a reduction of earnings, damage to tools, interference with production, etc. Not more than a dozen complaints were received, and in all cases these could easily be adjusted. *This determined the fact that painting could be accomplished before machining.*

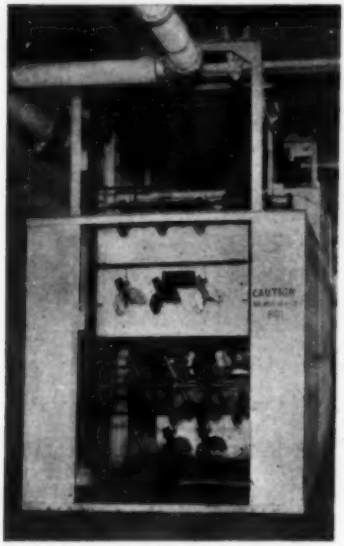
Consideration was given to the "brush" paints that were being used at the time of the survey, to ascertain whether or not they would lend themselves to spraying and dipping with satisfactory results. After some experimenting it was decided that these materials were not satisfactory; they were not formulated for successful application by spraying or dipping.

New Enamels and Fillers Were Carefully Chosen

A new synthetic enamel that could be sprayed, dipped or brushed was chosen. It produced a hard durable finish which was not easily chipped or marred, and the final paint film was resistant to acids and alkalis. Several tests were made before adopting these new materials.

Regarding fillers, several types were tried. Eventually a suitable non-porous filler was procured. During the period of experimenting with fillers, considerable attention was directed to the sanding operation which follows filling and drying. Sanding represented almost 50% of the labor cost of painting. It was too high. Sanding caused a considerable amount of dust to float around the paint room, and, of course, this dust settled on everything and interfered with the

production of a clean smooth finish. Flying dust is also an undesirable factor from a health standpoint. Accordingly we isolated the sanding department from the finishing room and installed a dust-collecting system.



One end of a dipping-drying unit wherein small parts are hung to a crossbar conveyor. They are automatically dip-coated with paint and then oven dried. At one end of machine a workman loads conveyor with unfinished parts and removes bake-painted parts.

The emery cloth that had been used was too coarse; it made deep scratches some of which showed through the final paint job. No. 80 grit abrasive paper was recommended for use on the portable power sanders which we decided to use wherever machine sanding could replace hand sanding. No. 150 sandpaper was used for hand sanding.

For filling in the blow holes and depressions we selected a knifing filler that would not shrink or crack; one that would provide a hard durable surface. A knifing filler that is long in oil causes shrinkage and cracking, as well as presenting a soft surface which is easily marred.

After the filler coat had been selected a primer surfacer was adopted. This type of material helped to make a smooth even surface; it also acted as a sealing coat to the filler so that only one coat of enamel was needed to produce a smooth finished surface.

After the machines were assembled it was only necessary to give them a touch-up coat to cover any marred places. The cost of painting on the assembly floor was reduced considerably.

The following paint materials were designated for use in the improved setup: Rust-inhibitive primer (this material is also used as an oil-resistant coating); knife filler; brush filler; primer surfacer; synthetic enamels for spraying, dipping, brushing and touch-up work; and crank case sealer.

Selection and Location of New Equipment

During the survey the paint department production for one year was analyzed, as to its cost under the old procedure. The weights and sizes of castings painted over a period of eight weeks were recorded. These figures were considered as being representative for estimating the amount and size of equipment necessary for the proposed system. Manufacturers of ovens, spray booths, tramrail systems, degreasing machines and sandblasting equipment were interviewed and invited to submit proposals to the management. *(Cont'd on page 44)*

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Our Technical Department will gladly assist in adapting ACP Products and Processes to your manufacturing requirements. Address Dept. B-3.

American Chemical Paint Co.
AMBLER ACP PENNA.

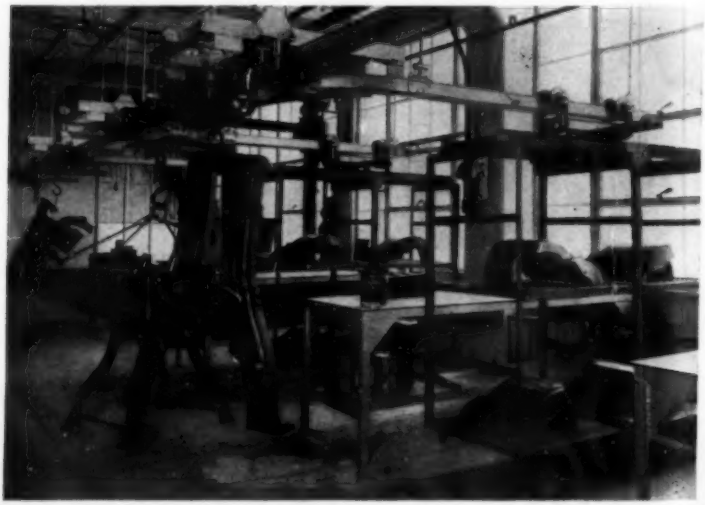
In considering the proposed layout, new locations were recommended for the painting activities. The foundry was selected for the prime coating department. Here all castings could be primed and then handled with very little transportation. Also, the location of the foundry is close to the space for outdoor casting storage, both before and after machining operations. The sanding and finishing departments are located close to the assembly floor and the finished-parts stock room.

After the metal cleaning (tumbling or sandblasting) and snagging operations have been completed, castings are transferred by an electric or hydraulic truck to the priming department. Here they are suspended from an overhead tramrail system and moved to a spray booth.

Heavy Tramrail System Simplifies Transferring

Included in the tramrail system are steel racks of 1-ton capacity for suspension from the tramrail I-beams by means of ball-bearing trolleys. Each rack is arranged to hold six removable shelves for small parts to be laid thereon. Steel angles are included to be placed in the racks and to carry hooks on which medium size parts can be hung. Also, the system includes 1-ton capacity, 4-wheel ball-bearing trolleys with swivel eye-bolts to which can be attached hooks for the purpose of handling large individual castings, so that these castings can be sprayed without removal from the tramrail system.

A carrier moves one or more castings into the spray booth where the priming coat is applied. The same carrier then moves the painted



View in the filling room where the rough surfaces of raw iron castings are filled to properly prepare them for smoothing and final painting.

Pave the way for long-lasting paint adhesion with Oakite Cleaning and Oakite Conditioning

Even the best paint or lacquer coat will flake and fail prematurely if metallic surfaces are not first properly cleaned and conditioned. That is why it will pay you to investigate Oakite alkaline, acid and solvent-type pre-finishing cleaning materials! Applied by still tank or spray-washing machine methods, these materials quickly and thoroughly prepare a wide variety of metal surfaces for durable and tenaciously adhering finish coats.

Ask the Oakite Technical Service Representative near you to demonstrate the fast emulsifying and free-rinsing properties of these specialized materials . . . for complete removal of oil, grease and dirt . . . for uniformly clean surfaces that facilitate adherence of even, long-lasting finishes.

Oakite in-plant services are free, helpful, money-saving. Free, too, is the fact-filled Oakite Digest "Production Cleaning of Die Castings." Write for YOUR copy Today . . . to speed finishing operations and reduce rejects!

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Technical Service Representatives Located in All Principal Cities of the United States and Canada

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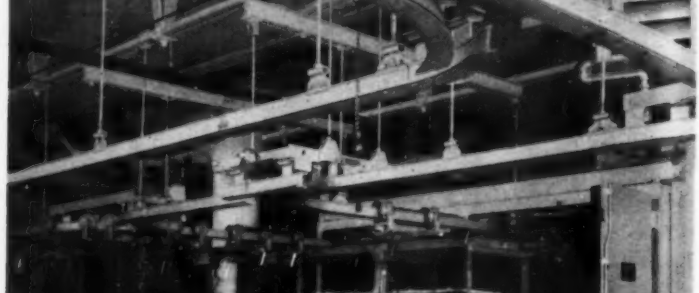
casting to the oven. After baking for 30 minutes at 250° F. the primed castings are removed from the oven for cooling; then they are pushed to the outer track. A tramrail and electric hoist are provided inside the priming room to permit the unloading of heavy castings inside if and when desirable.

Cleaning; Filling; Baking; Sanding with Cleanliness

When large castings are transferred from outside to the paint department they are cleaned preparatory to filling. A hydro-steam cleaner outfit is used; it produces an atomized spray which is especially efficient for removing heavy grease or slush. Cleaned castings are picked up by means of an electric hoist and interlocking transfer cranes, and moved to the filling section. They are filled and then transferred to the ovens where the filler coat is baked for 27 minutes at 250° F. After leaving the oven the castings are moved to the sanding room where an electric hoist is available for unloading them onto platforms (if necessary) on which they are conveyed to a sanding booth.

Small filled parts from the oven are removed from the racks and sanded over a waterwash sanding table. Then they are placed on the rack and sent to a spray booth for the primer-surfacer coat. Larger castings are sanded in a waterwash booth which has facilities for collecting sander dust. In many cases heavy castings can be kept on the tramrail system while they are be-



Entrance of ovens into which castings are moved to bake the filler coat.

*CHEMICALS to Clean and prepare metal for painting

Sol-Klean . . . PHOSPHORIC ACID METAL CONDITIONERS

Prezaint . . . . MAKES PAINT STICK TO ZINC AND GALVANIZED

Industrosolv. SOLVENT EMULSIONS FOR SPRAY WASHING MACHINES

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PREPARING ALUMINUM FOR PAINTING?

Here are FOUR tested procedures for preparing aluminum for painting. Each is in operation in plants which were painting aluminum even before the war. Each procedure produces a surface which is clean, etched, and coated with phosphate.

No. 1. Brush Sol-Klean Phosphoric Acid Metal Conditioner on the aluminum. Then wipe or wash off with water the Sol-Klean and emulsified soil.

No. 2. Spray Phosmul — an emulsion containing phosphoric acid — on the metal. A single or multiple staged power washing machine may be used.

No. 3. Clean and etch the aluminum with hot alkali solution; rinse first with water and then with hot diluted Sol-Klean to assure an alkali-free surface. Either dipping tanks or a power spray washing machine may be used.

No. 4. Clean with hot alkali solution inhibited to avoid etching; rinse with water; treat with Sol-Klean to etch the metal and coat it with phosphate. Finally rinse with water. Employ either dipping tanks or a spray washing machine.

One or more of these procedures can be adapted to your job and facilities. Please write for details.

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ing sanded. The sanding room is partitioned off from the paint room and its doors are opened by an electric motor attachment. Vapor proof lights and explosion proof motors are installed throughout.

Primer-Surfacer; Baking; Enamel Coat; Final Bake

When filled castings have been sanded they are transferred by tramrail to a large waterwash spray booth where the primer surfacer coat is put on. Paint for spraying is kept in pressure tanks, each of which is equipped with a motor-driven agitator. An air gun is supplied each sprayer for blowing off the loose dust.

At each spray booth a can of paint thinner is supplied for use in removing any overspray from machined surfaces. Each spray booth is lined with heavy paper which is held in position by grease. Large sheets of corrugated board are taped to the floor inside each booth. A coating of aluminum paint is sprayed over the paper to produce a good lighting effect. When it is time to clean the booths the coated paper can be easily removed and replaced with clean paper.

When primer surfacer has been applied the castings are transferred to the oven for a 27-minute bake at 250° F. Following a reasonable cooling period the castings are transferred to the enamel spray booth, which is also a waterwash booth. After the enamel coat is applied, the castings are moved to the oven and given a 54-minute bake at 250° F. Then they travel to the unloading station where they are transferred to skids for delivery to the machine assembly department.

Some small castings receive only one coat of enamel. Others receive a coat of primer-surfacer and a coat of enamel. This depends upon the location of the part in the machine, as all hidden parts require only one coat of paint.

Castings to be dip-coated are transferred directly from the foundry (after tumbling or blast cleaning) to the dipping tank. One coat of paint is applied and this is baked for 30 minutes at 250° F.

Each oven is equipped with a pneumatic carrier puller controlled by an electric timing device which can be set for the length of time for baking. When the proper time has elapsed, the timing device opens a solenoid valve, causing the carriers in the oven to advance one space. A device at the discharge end advances the last carrier sufficiently to permit the doors to close behind it. These operations are entirely automatic, so the opening and closing of the discharge doors is done quickly with a minimum loss of heat. Each carrier can be turned, when necessary to conserve oven space.

All materials are sent directly from the receiving department to the paint storage room, which is equipped with fireproof doors to separate the paint department from the paint storage room.

System of Close Control on Everything Used by Workmen

The man in charge of all paint materials is responsible for the proper mixing of the paints. He also has charge of the spray guns. Each spray operator has a duplicate set of spray guns and he alternates the use of each one daily. This allows the maintenance man ample time to clean the spray guns and make the necessary adjustments every day. Along with these duties the maintenance man finds time to do some of the brush work.

All of the painters—sprayers, dippers and brush men—are required to get their supplies from

Here is Egyptian's new Baking White Enamel

Resistant to:

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Spray it on clean bare metal. Needs no primer. Bakes fast to a hard, glossy finish.

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the stock man each morning, or as often during the day as may be required. All paint materials are given to the men ready mixed and they have strict orders against changing any material by adding thinner. Also, special precautions are taken to use the exact air pressure prescribed for spraying, and to observe the time and temperature specifications for bake finishing.

The setup just described represents a pre-planned installation which has worked—and it has paid dividends. Savings have been effected to pay for the equipment, and during the past eight years it has taken care of all production demands, including the heavy peak loads brought on by war work, without any changes whatsoever being necessary in the original layout and procedure.

Zapon Puts on Two More Sales Engineers

The Zapon Division of Atlas Powder Co., Stamford, Conn., announces the appointment of Ralph C. Peck and Roy S. Steeley as sales engineers, in connection with its current expansion of sales personnel.

Mr. Peck, who has been assigned to cover industrial accounts in Eastern New York State, formerly was engaged in the paper manufacturing and distribution fields. During the war he was purchasing agent for a concern in Watertown, N. Y.

Mr. Steeley, who has been assigned to Western New York State, previously was assistant plant manager of the Stamford Electronic Division of Maguire Industry. He also served in the mechanical research and development engineering fields.

Ralph C. Peck

Roy S. Steeley

Robert Weltlich Joins J. E. Harris Co.

The appointment of Robert Weltlich as Industrial Sales and Service representative is announced by A. E. Braun, Pres. of the J. E. Harris Co. (Protective Finishes) Wooster, Ohio.

A native of Orrville, Ohio, Mr. Weltlich was associated for many years with a large manufacturer and is experienced in industrial and maintenance finishes, serving for several years as a buyer. He has just finished a 3-month schooling period at the Harris plant in all uses of the many Harris industrial finishes. Mr. Weltlich will cover Northern Ohio, Western Penna., and Eastern Indiana.

R. Weltlich is now Industrial Sales & Service Representative for J. E. Harris Co.

Paint's Biggest Year—1945

Paint, varnish and lacquer sales passed the 700 million mark in 1945 for the first time in the industry's entire history. The grand total was $723,699,389.

On the basis of reports by 680 establishments to the Bureau of the Census, they were 4.1% above 1944, the highest previous year; 13.2% above 1943, which was the highest year prior to 1944; 21.5% above 1942, and 15.8% above 1941.

Compared with 1940, when our country became actively defense-conscious, the increase in 1945 was 56%, and compared with 1929, the highest year prior to 1941, the gain in 1945 was 47.9%.

DIE CASTINGS CAN BE

COLORFUL*

with DYKAST Lacquer Enamels

DYKAST air-drying lacquer enamels are especially designed for direct application on zinc and aluminum die castings. These enamels have excellent adhesion on zinc, aluminum and most other metals, and cover well with one spray coat. Available for spray or dip, in standard or special colors, and in gloss or semi-gloss grades. *DYKAST* enamels give an attractive, durable, tough, flexible finish. We also have other lines of plain or metallic enamels for use on die castings and other metal products, both air-drying and baking.

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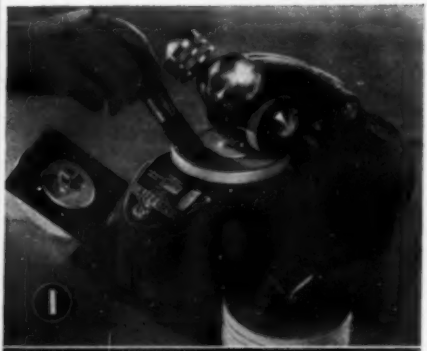
Testing the Wearing Quality of a Finish



BY ARTHUR P. SCHULZE

WHEN SELECTING protective or decorative coatings for various products, it is desirable—and frequently necessary—to find out how well those final paint, varnish, lacquer or enamel films are going to stand up under the wear and tear of service. Of course, some areas of a product are seldom touched except for occasional cleaning, but other areas are rubbed, handled or contacted frequently. A coating that will not long withstand this user's service is not wanted. If such a coating were put on products, its rapid wearing away under the long test of ordinary service, would certainly discredit the product, the store or salesman who sold it, and the manufacturer. Such an occurance would be particularly unfortunate, especially in these days when we know that coatings which will withstand long hard service are available.

Wear-testing of paint films can be made on samples in advance. It gives facts with scientific precision; and it is as practical as it is accurate. Performed under laboratory conditions, it provides data closely paralleling that obtained by actual service tests. *(Cont'd on page 54)*

Key to illustrations shown at left.
1) Refacing calibrase wheels.
2) Mounting specimen on abraser.
3) Running a typical test on abraser.

Industrial Finishes

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Hot Water Heaters
License Plates
Prefabricated Homes
Prefab Farm Buildings

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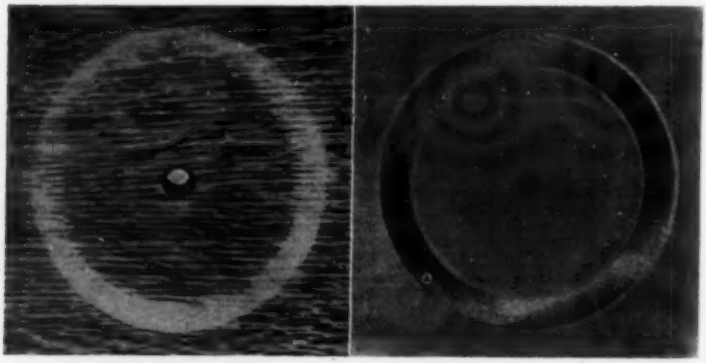
This particular technique, fast becoming more widely known among product manufacturers as the "Taber Abraser Test", involves the use of a precision-built instrument designed and made expressly for product wear-testing purposes. It establishes a scientific wear rating that provides a standard value for measuring the wearability of various coating materials and finished surfaces.

How the Wear Testing Device Works

A sample specimen for the test is rotated under abrasive or "wear" wheels, a choice of which is available to suit various products and conditions. Referring to pictures of the device, the free end of each of the two arms on which a calibrase wheel is mounted, has a place for attaching a small weight. Interchangeable weights are available, weighing 125, 250, 500 and 1000 grams respectively. A counter on the unit records each wear cycle as it occurs. The total number of "wear cycles" that are made and registered affords an accurate report of the wear characteristics for immediate or future comparison. Recorded for reference purposes, such data is valuable in connection with continued basic research and further product study.

This method of testing is fundamentally sound in principle and relatively simple in operation. The abraser test can be arranged to closely duplicate, in measurable terms, the rubbing abrasion that a surface coating encounters under actual service conditions. The two "calibrase" wheels are positioned in such a way that they produce a unique rotary transverse sliding action alternately back and forth across the surface of the test specimen.

Revolving in opposite directions through frictional contact with the specimen, these calibrase wheels exert a combined abrasive, compressive and twisting action twice in each complete revolution of the specimen holder. The abrasion lines resulting from this 3-way action take the form of two arcs crisscrossing each other, and cover a circular area of approximately



Test panels after removal from abraser. Notice circular path made by wheels.

ZAPON XE 606A LACQUER ENAMEL

stays on the job!

Westinghouse Electric's war-famous "Bug Bomb" has now been made available for civilian-industrial uses. It is finished with Zapon Lacquer Enamel—the same finish that did a good wartime job—which is now doing a good civilian job.

"Bug Bombs" for the U. S. Army called for two coats to stand up under ANY moisture and temperature conditions, but it was found that Zapon's ONE coat rapid-drying lacquer enamel filled all requirements and, in addition, resulted in an attractive appearance.

Whether the task is surfacing a "Bug Bomb," a little-finger-size lipstick case, or heavy-duty industrial equipment, ZAPON finishes offer many war-tested advantages for mass production.

This lacquer enamel is not new, but has been doing this kind of job since 1936. It is now available in all colors and in any degree of sheen for all civilian uses.

WESTINGHOUSE BUG BOMB

—originated for U. S. Army, now available for civilian-industrial uses.

ZAPON

ZAPON DIVISION

ATLAS POWDER COMPANY

Eastern Sales: Stamford, Conn. Western Sales: No. Chicago, Ill.

SPECIALIZED PRODUCTION FINISHES . . . *Doing Tomorrow's Job Today!*

ten square centimeters. Wear is maintained at a constant rate throughout the cycle.

Procedure Followed in Making a Wear Test

Making an Abraser Test is not a difficult or complicated procedure. Five simple operations are required, as follows:

1) Preparation of Specimens—Test panels are prepared and cut into 4-in. squares. Then a center hole is punched or drilled through each one. Flexible specimens, such as fabrics, are placed over the holder and clamped tight by an adjustable ring, or cemented to a rigid backing (any suitable metal plate).

2) Refacing Calibrase Wheels—Before making a test, the calibrase wheel surfaces are refaced by running them 50 cycles against an abrasive disc mounted on a special refacing table supplied for this purpose. This refacing operation is recommended because it insures clean standardized wheel faces for the start of every test.

3) Mounting Specimen on Abraser—The refacing disc holder is removed. Then the specimen holder and sample are mounted on the abraser and the abrading wheels are lowered into testing position.

4) Running the Test—With the counter on the abraser set at zero, the switch is turned on and the test is started. The specimen rotates at a speed of 60 to 70-r.p.m. In general practice, the test continues until abrasion impairs the appearance or serviceability of the specimen to the degree desired, or for some definite pre-determined number of cycles. The test may be stopped at any time, however, for inspection if the operator so wishes.

5) Determining Loss in Weight—The numerical wear factor for plastic materials and coatings can be computed by weighing the specimen before and after the test. It is weighed on a laboratory balance, and calculations are made according to a formula supplied by the company that makes the abraser.

So versatile has this abraser technique proved in actual factory testing that specimens of virtually all materials subject to surface wear may be prepared and tested for abrasion resistance simply and quickly. As a result, their potential serviceability can be measured accurately.

Smooth and coarse-grain leather, rubber and fabrics are readily tested with various abraser setups. Surfaces of luggage and hand coverings, subject to more moderate wear, are tested with resilient type calibrase wheels.

Still another material that can be abraser-tested for wear-resistance is linoleum. Printed linoleum with a protective varnish coating over the color print is tested with a resilient wheel in the same general manner as the printed surface. The test is continued until the appearance of the sample is impaired. In all testing by this method the cycle count affords a comparative value for testing other samples under identical conditions.

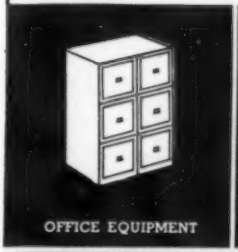
L. E. May, Sherwin-Williams Chemist Dies Suddenly

Laurence E. May, nationally known chemist of the Sherwin-Williams Co., died suddenly Friday, March 1, at his home in LaPorte, Ind., from coronary thrombosis. He was 51.

Mr. May joined Sherwin-Williams 30 years ago, shortly after graduating from Bradley College, Peoria, Ill. At the time of his death, he was general superintendent of the Pigment, Chemical & Color Mfg. Departments at the Chicago Sherwin-Williams plant.

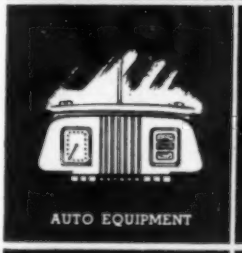
He is survived by his wife, Mildred, a son, Robert, recently returned from the Army; a daughter, Dorothy, who is a student at the University of Illinois, and one brother of Miami.

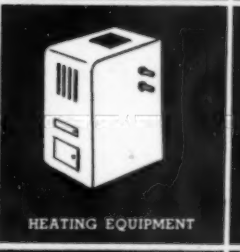
Whether you start with...


OFFICE EQUIPMENT

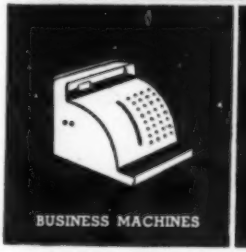
STORE FIXTURES

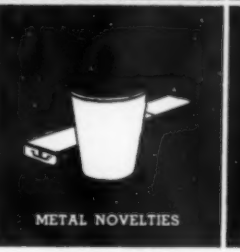
RADIO EQUIPMENT


AUTO EQUIPMENT


HEATING EQUIPMENT

HOME APPLIANCES


BUSINESS MACHINES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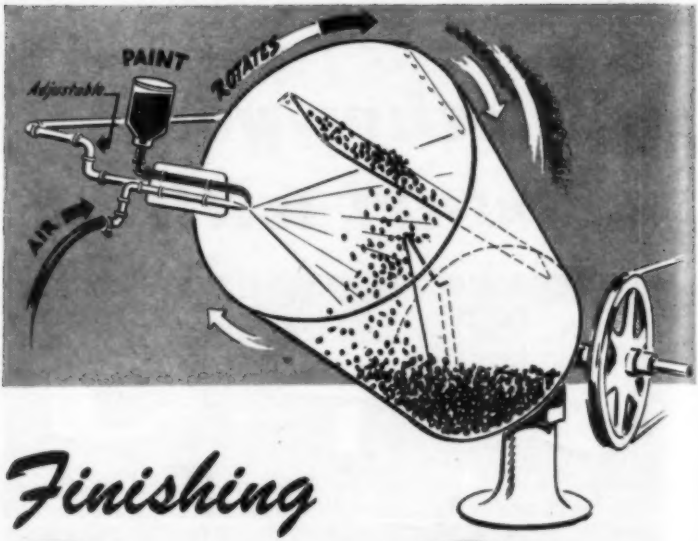
FREE DIMENSO BOOKLET

A request on your business letterhead will bring the descriptive DIMENSO BOOKLET. The Sherwin-Williams Co., Cleveland 1, Ohio.



Finishing Detachable Buttons

BY ARTHUR A. OERTEL

Factory Manager of
J. V. Pilcher Mfg. Co.

Process developed includes dry cleaning by tumbling and screening; coating by spray-tumbling and force drying in a gas-fired conveyorized oven.

The bachelor button is all metal and consists of two parts — the front face member which you see on a garment, and the smaller back member which has a stud that clamps and holds the button in place on the garment. The two parts interlock to hold the button in place. You can take the two parts of a bachelor button apart or clamp them together with your fingers at will, but they do not come apart in service.

Conditions Imposed by Design of Product

The cleaning and painting of these bachelor buttons presented a number of problems. The joining parts (a stud fitting into a socket) of each button must always work

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ENGINEERS OF PRODUCT FINISHES

freely, therefore our plans for the cleaning, coating and force-drying operations had to be governed accordingly. This removed from our production picture the possibility of using trichlorethylene vapor degreasing; or coating the buttons by dipping, whirling or ordinary simple tumbling. We had to have clean dry metal surfaces, and we had to have a dependable, lustrous, full-cover durable finish.

After much thought and a lot of experimenting, we finally developed a set of operations which produces a highly acceptable gloss finish—one that is smooth, black and durable; and it permits free movement of all working parts in each button.

The stud is composed of two parts—the stud pin and head (in one piece), and a metal finish cap which is crimped around the stud head in such a manner as to permit the stud head to turn freely inside the cap. Before the finish cap is crimped over the head, the studs are tumbled in sawdust and cob meal for two hours to remove all traces of oil and grease.

Following tumble-cleaning, the entire contents of the tumbling barrel are dumped into a hopper connected to a revolving cylindrical screen 18-in. in diameter and 12-ft. long. The infeed end of the screen cylinder is about 12-in. higher than the outfeed end. This arrangement permits the sawdust and metal die shavings to sift through the screen as it revolves, and while the studs are sliding along toward the outfeed end. Upon removal from the screen cylinder, the finish caps are crimped on and the studs are ready to be painted.

The buttons—that is the part you see on a garment—are cleaned by a different procedure. They are taken from the machine room, placed in metal trays and passed through the same oven that is used to bake the black japan finish. About one hour is required at 400° F. to burn off the oil and grease from the buttons and out of their hollow centers. They are allowed to cool before being painted. The metal must be cool enough to handle comfortably before paint is applied; otherwise the first coat of black japan would dry too quickly; in fact, it would dry as fast as it could be put on, and if this procedure were allowed to continue, we would have an unsatisfactory finish.

Planning a Suitable Coating Procedure for our Product

We found that the best way to put on black baking japan in sufficient quantity to get complete coverage of all parts of both studs and buttons, and at the same time prevent objectionable accumulations of material which would interfere with a free movement of parts, is to combine spraying with tumbling. Both studs and buttons are put through identical finishing and baking operations, but the two parts are not finished together. If we did this, some of the studs would become engaged with buttons in the tumbling barrel and when the coating was baked the two pieces would be stuck together. Inasmuch as both buttons and studs receive identical treatment, from this point on I shall refer to both components as "buttons."

Successful finishing depends upon a combination of several things each of which must be done correctly. The black baking japan must be of just the right consistency. If it is too heavy, trouble will occur. Our usual procedure is to mix 4-oz. of japan with an equal quantity of naphtha. This mix is strained through a fine mesh screen and poured into a cup which sup-

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Remember, Santocel has now been used successfully for years in producing superior matte lacquer finishes having nitrocellulose, cellulose acetate, ethyl cellulose or vinyl resin bases . . . also, more recently, as an equally efficient flatting agent for synthetic resin (alkyd, urea or melamine) and oleoresinous varnishes.

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3. **Resistance to marring**
4. **Delustered appearance**
5. **Flexibility**
6. **Better adherence**

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plies the spray nozzle. The fine mesh screen is thoroughly washed in naphtha after being used. This is important to prevent clogging of the spray nozzle, and to avoid the loss of time that would be involved in cleaning it.

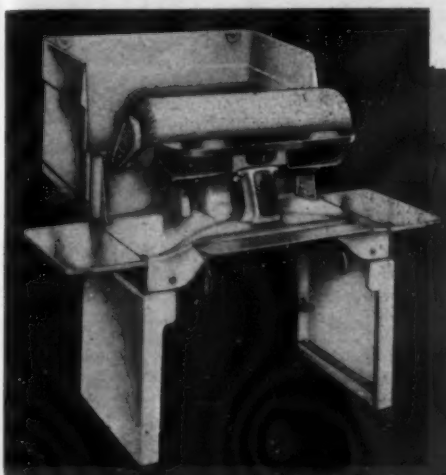
Our Spray-Tumbling Setup for Coating Buttons

Our tumbling barrel, as illustrated at the beginning of this article is one of those that is open at the top and its axis of rotation is tilted about 30° from vertical. The open top end is left uncovered during operation. The inside of the steel barrel has two metal fins set in at a slight angle, so that when the barrel revolves, the fins cause the buttons to "rain" from one position to another in quick succession, during which time they receive a spray coat of black japan. The barrel revolves at 40-rpm. It takes about three minutes to spray the ½-pint of paint. Then the spray nozzle is swung back out of the way and the buttons are tumbled for another three minutes. About 11,000 buttons constitute a batch for the tumbling barrel.

Our Oven Drying Technique is Economical and Effective

Buttons are poured from the tilting barrel into metal trays 12 by 30-in. by 2-in. deep. These trays

Filled trays of painted buttons move through a conveyorized gas-fired oven wherein the black japan coating is baked at 400° F. Metal trays have wire mesh bottoms. The conveyor is an "apron" type, consisting of metal cross slats fastened to parallel chains which run over sprocket wheels. The speed is geared down to about 2-in. per minute.



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have heavy wire mesh bottoms. Four trays will take one barrel batch of buttons. These four trays are stacked one on top of the other, with two angle iron separators between trays to permit circulation of air while in the oven. Filled trays are placed at the infeed end of a conveyorized oven (as shown in Fig. 2) and they travel through the oven at the rate of 2-in. per minute.

The first section of the oven—a section about 6-ft. in length—serves as a pre-drying or pre-heating chamber. Direct gas heat is blown down into the remaining section of the oven where the paint is baked at 400° F. Elapsed time for a trip through the entire oven is one hour and 12 minutes. Fumes are exhausted from both ends of the pre-heater and oven. This helps to provide continuous circulation of air in the oven. The gas heating unit on top of the oven is thermostatically controlled. Trays of buttons, removed from the oven, are allowed to cool until they can be handled comfortably.

The same procedure as just described for the first coat is repeated for the second and third coats—that is, with one exception. In spray-tumbling the second and third coats of black japan, the tumbling barrel is stopped immediately after the spraying. Reason for this is that the buttons are still warm from previous baking; if they were allowed to tumble after spray coating, the paint would dry too much before pre-heating and as a result we would have a dull finish instead of the desired high gloss luster.

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Finishing FURNITURE

BY RAYMOND C. ADAMS
Technical Director, Gilman Paint & Varnish Co.

THE QUESTION has been asked, "What is the comparative cost of finishing 1,000-sq. ft. of case goods with varnish, as compared to a lacquer of high-solids content?"

If, and before, this question can be answered, it is necessary to define varnish and lacquer of high-solids content. The National Paint Dictionary definies varnish and lacquer as follows:

Varnish: Any homogenous transparent or translucent liquid which, when applied as a thin film, dries on exposure to air to a hard film, giving a decorative and protective coating to the surface to which it is applied.

Lacquer: The term "lacquer" usually indicates that the material dries by evaporation, and forms a film from the non-volatile constituents. However, there are many different types of lacquers, defined as follows: Cellulose derivative lacquers are the most important, such as nitrocellulose, cellulose acetate, methyl cellulose; also ethyl cellulose and benzyl cellulose; these are known as the modern lacquers. The nitrocellulose lacquers being

(Continued on page 75)

Editor's Note: One of our friends has asked for comparative figures on the cost of finishing say about 1,000-sq. ft. of case goods (furniture) with varnish, as compared to lacquer of high-solids content. He believes that such things as speed, man hours of labor and all other incidental details that enter into production finishing should be taken into consideration.

Recalling that Mr. Raymond C. Adams has had considerable experience with furniture finishes over a period of several years, and that he has made comparative tests with varnishes and lacquers, we submitted the question to him. Accordingly, he prepared this article and submitted it with a letter containing the following paragraph:

Your question, although seemingly simple enough on the surface, when thoroughly analyzed, brings up a number of technical questions with regard to lacquer and varnish. . . . I have written a rather detailed discussion on this subject, in which I have tried to compare varnish and lacquer as finishing materials for furniture.

Naturally, any article wherein the author discusses the relative merits of two classes of competitive materials for the same job, is almost sure to contain some controversial points—some things with which others may disagree. This article is probably no exception. Comments will be welcome.

the most important commercially are the type which have the greatest consumption. Resins, plasticizers, solvents, and diluents (with or without pigments), are usually added to nitrocellulose to produce commercial nitrocellulose lacquers or enamels. Can lacquers were originally oleo-resinous varnishes baked at elevated temperatures on the interior of beer and food cans. However, more recently spirit varnishes, vinyl resins, and cellulose derivative lacquers in suitable solvents have been used to a greater extent. Spirit lacquers, such as, damar in alcohol, copals and Congos in appropriate solvents, and solutions of shellac in alcohol are sometimes referred to as lacquers.

The word "lacquer" in this case originated from "lac" or "shellac." Chinese lacquers, Rhus lacquer or Che Shu lacquer, are made from the sap of the tree rhus vericiflua, and are the chief ingredient of urushoil. This lacquer, contrary to the general opinion of lacquer chemists, dries by the absorption of oxygen from the air in a cool, moist atmosphere. One disadvantage of this type of lacquer lies in its poisoning effect on the epidermis. This gives an effect similar to the familiar poison ivy. Burmese lacquer or Thitsi is made from the sap of an oriental tree, the chief ingredient of which is thitsiol or laccol. It is very similar to Chinese lacquer, but is devoid of the acrid and irritating properties of the latter. Japanese lacquer and Formosan lacquer are similar to Chinese lacquer.

* * *

Obviously, from these definitions, to properly compare varnish and lacquer would necessitate definite knowledge of the composition of the materials, since there can be such wide variations in varnishes and lacquers that meet these def-

initions. Since the question that has been asked simply refers to varnish and lacquer of high-solids content used for finishing furniture, it will be necessary to more definitely classify them.

Characteristics of Lacquers; Fast Drying; Thin Films

Lacquer, as the definition states, usually consists of those finishes made with nitrocellulose as a base. Until the last few years most nitrocellulose lacquers, if not all of them, dried only by the evaporation of the solvents. Thus, the nitrocellulose and resins with their fast solvent release enable the chemist to formulate lacquers that dry quickly.

From the time that nitrocellulose lacquers were first introduced, their main disadvantage when compared to varnish has been their poor "build" (thin film). This has not been as great a disadvantage on metal as it has on wood. In finishing metal there is very little penetration. The reverse is true of wood.

Nitrocellulose lacquers, because of their lower solids (film-forming ingredients that remain after the solvents have evaporated) require more coats to produce the same "build" as that of a varnish. The lacquer chemist has long realized this disadvantage and has constantly striven to increase the solids, and thus the build of his nitrocellulose lacquers. Great accomplishments have been made in this connection especially when you consider the few years that lacquer has been known, as compared to the centuries that we have known about varnish.

Although nitrocellulose lacquers compare unfavorably with varnish in the matter of build, their speed of drying has been their big advantage over varnish. This speed of drying often makes for greater production (all other factors such as size of finishing room, etc., remaining the same) which, of course, interests the furniture manufacturer. This is the reason why, in many instances, he has changed from varnish to nitrocellulose lacquer.

This change to nitrocellulose lacquer greatly increases the final material cost of the furniture finish because: 1) In most instances the nitrocellulose lacquer costs more per gallon; 2) a gallon of nitrocellulose lacquer does not cover as much surface as does a gallon of varnish; 3) more coats of nitrocellulose lacquer are required.

Mr. Nitrocellulose Lacquer Manufacturer is quick to reply that the increased material cost, due to using nitrocellulose lacquer, is more than offset by the speed of drying, which hastens completion of the final finish, thus saving on labor and overhead costs. This economy gained with nitrocellulose lacquers is largely sales talk. Whether or not there is any saving in handling, let alone enough to offset the wide spread in material costs, is entirely dependent upon: 1) The type of furniture being made; 2) the size of the finishing room; 3) whether or not the finishing room is a bottleneck of production.

Type of Furniture Made is Factor in Choice of Finish

The type of furniture being made is closely related to the size of the finishing room; and also, whether or not the finishing room is the bottleneck. The type of furniture includes the size and the quality.

The size of furniture is important for two reasons: 1) Does it lend itself well to modern conveyerized handling? 2) what propor-

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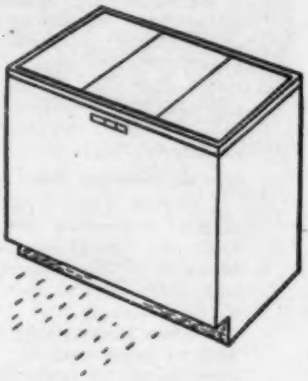

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tionate space does each item take up in the finishing room?

The quality of the furniture being made has a definite bearing in this instance, since with the better type of furniture greater care is shown. Everything, including the finish, must be perfect. Nitrocellulose lacquer, because of its fast drying, makes for greater ease of handling, less damage done to finish before shipping and while in transit. Everyone is more critical of the finish on an expensive piece of furniture and, since there is considerable scratching, scarring and printing before the item is placed on the display floor of the retail store, any factor that will minimize this condition is important. Lacquer, because of its fast drying, minimizes this condition.

Size of Finishing Room

The size of the finishing room largely determines whether varnish (air-drying) or lacquer can be used. If the finishing room is sufficiently large to allow furniture finished with varnish to properly dry before rubbing (if this is done) and to prepare it for shipment, even though it takes one or two days longer than lacquer, there is no economy in handling or production gained by the use of lacquer.

Actually, since at least one extra coat is required when lacquer is used, there is an increase in cost due to this extra handling. Consider the reduced production or increased labor, in addition to greatly increased finishing material costs. Assuming that the varnish finish and lacquer finish are equal from the standpoint of quality and appearance, it would be questionable for anyone with a large enough finishing room to use lacquer. As will be shown later, the material cost is about 300% more when using lacquer.

[Editor's Note: Cleanliness of atmosphere in the finishing room is a factor too. If particles of dust, dirt or lint are in the air while the wet coat of varnish is drying, they will settle on the slow-drying varnish and stick to it, whereas lacquer usually dries so rapidly that such particles do not stick to it.]

Is the Finishing Room a Bottleneck in Production?

Again, assuming that the resultant finish obtained with varnish and lacquer are in every way equal, the choice of one over the other would largely be determined by whether or not the finishing room is a bottleneck. Although a bottleneck in production can be caused by several factors, it generally resolves around insufficient room. If this is the situation, unless forced drying systems are installed to hasten the drying of varnish, lacquer can unquestionably be used to an economical advantage.

In recent years manufacturers of varnish have shortened the drying time of their products, both for air-drying and baking, and thus they have shortened the gap that gives lacquer its edge. Lacquer manufacturers have not been asleep, however, and they have shortened the gap of build that gives the edge to varnish by coming out with high-solids lacquer.

About eight or ten years ago it appeared that nitrocellulose lacquer just wasn't going to close the gap in build between varnish and lacquer. Even through the use of the then so called "Royalty Cotton," the viscosity of nitrocellulose lacquer just couldn't be lowered enough to give any higher solids at spraying consistency. About that time two new "lacquer bases" — ethyl cellulose and chlorinated rubber— came on the market with high-solids advantages. A great

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Stanley Chemical

deal of work was done in adapting these types of lacquers to the furniture industry. Although they had the high build advantages, certain other disadvantages were apparent from the start. Some of these disadvantages were just being ironed out when the war broke out, at which time they became unavailable for furniture use.

Lacquer With More Build; High-Solids Lacquers

Chlorinated rubber and ethyl cellulose somewhat revolutionized one of the main concepts of nitrocellulose lacquers, in that oxidizing materials were incorporated in their formulations. The addition of these oxidizing oils and resins, by increasing build, served to further bridge the gap between varnish and nitrocellulose lacquer. Many of the formulations gave build equal to a varnish and yet didn't slow up the normal lacquer drying materially.

The question could be asked, "Why, if these new types of lacquer contain oils and oxidizing resins, shouldn't they be called varnishes?" There are probably two reasons. 1) If by any chance they could be called lacquers that embody the high build of varnishes, then they have better sales appeal. 2) They should rightly be called lacquers since the main portion of their drying and characteristics is similar to lacquer that dries by evaporation of its solvents.

When it was seen that oxidizing oils and resins could be added to other lacquer bases a great deal of work was done toward utilizing them in nitrocellulose lacquer. Then, came into being one type of what is normally now called "high-solids lacquer." The term "high-solids lacquer" usually refers to a nitrocellulose-base lacquer into which have been incorporated a higher percentage of solids at spraying viscosity than is normally used. The term "high-solids lacquers" is used chiefly to denote special lacquers for wood finishing.

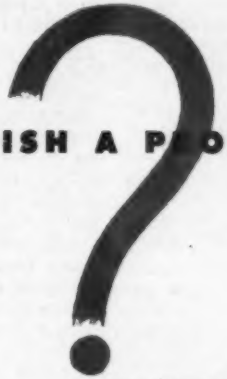
Some people believe that high-solids lacquers are over-rated. Before going any farther, I should like to make it clear that I am not trying to take sides as to which a furniture manufacturer should use, lacquer or varnish. I am simply stating my own views based on my past experience which, incidentally, has been largely spent in developing furniture finishes. Up to this point it might possibly seem that I am taking sides with varnish. On the other hand the greater part of my work has been with lacquer.

Few chemists have spent more time working with high-solids lacquers than have I. In 1939 I developed and marketed lacquers with resin-to-nitrocellulose ratios of 10 to 1, during a time when ratios of 3 to 1 were considered high. My first love is with nitrocellulose lacquers. Still I truly believe that they have reached their peak of popularity and use in the furniture industry. Why? For three reasons. The same number of reasons as there are high-solids lacquer (nitrocellulose base) types of formulations.

Three Basic Types of High-Solids Lacquers

In discussing these three basic types of high-solids lacquer formulations, it will be assumed that a high-solids lacquer must have not less than 25% solids at spraying viscosity. Spraying viscosity for lacquers will be considered to be 21 to 24 seconds at 70° F. on a No. 4 Ford cup.

The following are the three basic types of formulations for nitrocellulose lacquer coming under the heading of high-solids lacquers.



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1) High-solids lacquers made with high-viscosity nitrocellulose (5 to 6 seconds and higher), non-oxidizing resins, non-oxidizing oils and chemical plasticizers.

2) High-solids lacquers composed of the same materials as above except using low-viscosity nitrocellulose (½-second and lower).

3) High-solids lacquers utilizing the same materials as the other two types, as well as oxidizing oils and resins.

Characteristics of H. S. L. in My No. 1 Classification

Without becoming too involved in technical formulations it may be stated that the first type of high-solids lacquer (as named above) embodies the use of high-viscosity nitrocellulose because of its high tensile strength. Formerly this type of lacquer would have been called "non-royalty." It calls for the use of a high proportion of non-oxidizing resins (which make for good build), to as little high-viscosity nitrocellulose as can be obtained without sacrificing brittleness. This type of formulation is difficult to rub and it develops brittleness on aging.

Unfortunately, there are no basic specifications for furniture finishes. As such it is difficult to discuss two formulations under this catagory because one of them likely has much better quality than the other. However, I have never seen a high-solids lacquer of this type with satisfactory quality. If sufficient solids are obtained the film is too brittle. If the film characteristics are satisfactory the build is too lean to be classified "high-solids." Disregarding quality, even though these lacquers contain high solids, I have yet to see one that didn't require two coats to equal the build of one coat of varnish.

High Solids Lacquers in My No. 2 Classification

High-solids lacquers coming under the No. 2 classification (as mentioned on this page) are somewhat better than those in Group 1, but not a great deal. These formulations make use of a lower resin-to-nitrocellulose-ratio and, although their quality isn't much better, they don't become quite as brittle but have more of a tendency toward being cheesy. They will pass cold check cycles with a better rating and their films are easy rubbing. As far as "build" goes, they still require two coats to equal the "build" of one coat of varnish.

No. 3 Classification of High-Solids Lacquers

This type is the newest of the high-solids lacquers and is the one most likely to be encountered at the present time. By combining oxidizing oils and resins with nitrocellulose, lacquers of rather high "build," and reasonable quality can be obtained. Unfortunately, one coat of such a lacquer still doesn't do the trick and this is where the rub comes in.

These lacquers do not lend themselves well to recoating. They present a varnish-type film, and when they are re-coated, the solvents in the second coat bite into the first coat similar, although not nearly so badly, as when lacquer is applied over varnish. The second coat of lacquer may not actually lift the first coat, as with varnish, but what happens is that it softens it and penetrates and becomes absorbed in it, thus not adding to the "build" of the film.

This is characteristic, but to a lesser extent, with even the conventional type lacquers. To safeguard against this the chemist uses as lean a solvent mixture as

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possible, so it won't tend to soften the undercoats. The solvents necessary to dissolve nitrocellulose are strong, as is evidenced by the fact that lacquer thinner is also a good paint and varnish remover. However, if mild solvents, such as the napthas used with varnish, could be used with this new type of lacquer, it is possible that a lacquer sealer of high-solids (embodying the use of oxidizing oils and resins) plus one coat of this type of lacquer would give a "build" equal to varnish. Unfortunately, this is still a problem for the future. This type of high-solids lacquer does have some definite advantages over the other types, and it does offer greater future possibilities.

I think high-solids lacquers symbolize an attempt on the part of we chemists to supply the furniture industry with lacquers having better build, but . . . have we done it? Possibly a new type of spray gun that could handle lacquer at viscosities of 35 to 40 seconds, on the No. 4 Ford cup, would solve the problem. High-solids lacquers are still far from being a dead issue.

Finishes for Furniture in Different Price Classes

Up to this point I have been comparing lacquer and varnish, as is normally used on furniture. Further discussion of the word lacquer will deal with those materials of a nitrocellulose base which do not have over 21% to 23% solids at spraying viscosity. This is the maximum for good quality.

In my opinion there should never be any doubt as to whether a conventional lacquer or varnish should be used. Lacquer should be used on all furniture that is of medium to high quality. Whether lacquer or varnish should be used on cheap furniture is a matter of opinion and cost. I think varnish has a definite place on case-goods furniture of the inexpensive type for two reasons. First is cost. Second, the general appearance of an unrubbed varnish surface generally appeals more to the class of people who buy cheap furniture than does that of lacquer.

The quality of convention-type furniture lacquer that is marketed today (or possibly I should say before the war) is definitely better than furniture varnish that is marketed today (here again, I possibly should say before the war). This statement is made on the basis of a number of samples of various manufacturers' varnishes and lacquers that were obtained from furniture plants using these materials and tested, before the war, in an unbiased manner.

An attempt was made to obtain varnishes and lacquers that were representative of what the furniture trade was using, because obviously I couldn't have tested every furniture varnish or lacquer made. The lacquers, in general, proved far superior. You will note that *the tests were run on lacquers and varnishes that were being marketed; not on the highest possible quality lacquers and varnishes that could be made.*

Frankly, I think a good varnish finish is superior to a good lacquer finish, but *unfortunately the furniture industry doesn't use the best varnish that can be made.* For that matter the majority of furniture manufacturers don't use what might be called a medium quality varnish. Because of the demand for quick-drying finishes, furniture varnishes have been

Flo-Bak Synthetic Baking Enamel

Is a versatile coating material ideal for a wide variety of metal products such as hospital furniture, medicine and kitchen cabinets, scales, fluorescent fixtures, etc.

Easy flowing—High Lustre
Excellent retention of gloss
Tough and porcelain like finish
Highly resistant to acids, alkali, grease and alcohol
Available in all colors

The baking schedules are easily adjusted to any baking procedure.

300 DEG. F. FOR 10 MIN.

275 F for 20 min. — — 250 deg. F for 45 min.

[Order 5 gallons of Flo-Bak Synthetic Baking Enamel today and give it a severe production test.]

LACQUERS—THINNERS
METALLIZED FINISHES
SYNTHETICS AND
SPECIAL COATINGS
FOR ALL SURFACES

United Lacquer Mfg. Corp

General Offices, Laboratory, Factory: LINDEN, N. J.

NEW ENGLAND MFG. DIVISION, EVERETT, MASS.

shortened (ratio of gallons of oil to 100-lbs. of resin) to the point where they don't have real quality.

Material Cost on Typical Test Run of Furniture

I made the statement earlier that from the standpoint of material cost, high-solids lacquers cost 300% as much as varnish. This statement was made on the basis of a thorough test that I once ran on knee-hole desks. The following results were obtained:

1) High-solids lacquers covered 175-sq. ft. per gallon.
2) Varnish covered 250-sq. ft. per gallon.
3) Two coats of high-solids lacquer were required to equal the build of one coat of varnish.

Therefore, to coat 1,000-sq. ft. of surface required:
1) 11.42 gallons of high-solids lacquer (2 coats).
2) 4 gallons of varnish.

The cost per gallon was:
1) $1.40 for lacquer.
2) $1.25 for varnish.

Material cost summary follows:
11.42 gallons of lacquer at $1.40 equals $15.99 per 1,000-sq. ft.
4 gallons of varnish at $1.25 equals $5.00 per 1000-sq. ft.
Material cost of lacquer, three times that of varnish.

In addition to the material cost we must include the cost of spraying the second coat of lacquer, if a true comparison is to be made. I cannot give any figures on this as I do not have any reliable data on costs of application.

Now gentlemen, to those who might take offense at the statements that I have made, I repeat that these statements are all based on my past experience. Obviously, if anyone disagrees, one of us is wrong.

Statements Herein are Based on My Own Past Experience

As to what the furniture manufacturer may expect in the future, it seems to me that great advancements will be made in lacquers of other than nitrocellulose base. Whether ethyl cellulose or chlorinated rubber will be the answer, I do not know, but I think both are promising. Although the tendency at the present time is toward the use of baking ovens in which varnish or synthetics are baked, I think their main usefulness is in the manufacture of cheap furniture. The quality of most varnishes and synthetics that will bake out at 140° F. in one hour are questionable. The quality is better for those that require two hours at 140° F.—but how many furniture manufacturers have ovens that are large enough, or where the conveyor speed is slow enough, for a 2-hour bake? Before too long we should have new type lacquers, with varnish build and good quality, that will air dry in less than two hours.

I take sides at all times with quality finishes, as compared to those that just get by. For various reasons, such as they are, the furniture industry generally uses cheap quality finishing materials. Furniture finishes, unfortunately, are too often made to fit production schedules and costs, rather that the reverse. The wood, glue and construction of most furniture is in good condition long after the finish has lost its life. I am a firm believer that most people would gladly pay a little more money for a better finish. We, in the paint industry, can manufacture much higher quality finishes. Won't you furniture companies please give us that opportunity?

Remember Pearl Essence for

A Decorative Finish

MEARLMAID Pearl Essence is being used on hundreds of different products to produce a decorative and attractive effect.

Investigate the numerous advantages of a Mearlmaid Finish before you select the final coating. Its sales appeal and merchandising value are important.

THE MEARL CORPORATION

153 WAVERLY PLACE NEW YORK, N. Y.

ROSELLE, N. J. EASTPORT, ME.

Has High Reflective Light Value

For Dials Controls Instruments

"WORLD'S LARGEST PRODUCER OF PEARL ESSENCE"

Letters from Readers

Polishing Equipment

We would be pleased to have you suggest names and addresses of a few manufacturers of electric and pneumatic polishing equipment. We are particularly interested in equipment suitable for polishing caskets which we manufacture.—A. CASKET CO.

Look at the advertising section of any issue of this magazine.—ED.

"French" Finishing

In the September 1945 issue of INDUSTRIAL FINISHING reference was made to some previous articles published on "French" finishing with shellac and alcohol. If you have extra tear sheets of this article, I would like to obtain a copy.—M.R.M.

For Cleaning Hands

Could you give me the name and address of the company in St. Louis, Mo., who manufactures a product for removing lacquer from the hands? I understand that this is in the form of a cream, or in cake form similar to soap.—C.T.N.

Navy's Fire Retardant Paint

In your January 1946 issue, page 78, there is a paragraph on fire retardant paint, which mentions some recently published information by the Navy Department on this subject. I wonder if you could give me specific information as to the Navy Department information referred to and how it can be procured?—T.A.C.

The information requested is to be found on age 483 of Scientific Section Circular No. 710, dated September 1945. This circular is distributed by the National Paint, Varnish and Lacquer Association, Washington, D. C.—RAYMOND C. ADAMS.

Roller Coating Machines

We would greatly appreciate your giving us the names and addresses of concerns manufacturing roller coating equipment.—T.W. Co.

Try Black Bros., Inc., Mendota, Ill.

Traffic Line Marking

We would appreciate your furnishing us with names and addresses of manufacturers of traffic line marking machines. We are interested in machines used for zoning city streets, parking areas and safety line marking in plants.—V. Co.

Try Binks and DeVilbiss, whose 2-page, 2-color advertisements appear in every issue of this magazine.—ED.

Low-Bake Ceramic

Approximately a year ago I read an advertisement in INDUSTRIAL FINISHING which described a new type of low-bake ceramic material. This material could be sprayed on and baked at a temperature of around 300° to 400° F. It was resistant to acid fumes and corrosion. I have looked through many of your back issues, but have been unable to find the information on this product. I would appreciate your letting me know the name and address of the manufacturer of this material, if possible.—B.P.I.

Perhaps the product you have in mind is "Silco", a product of Mitchell-Bradford Chemical Co., 2445P Main St., Stratford Station, Bridgeport, Conn.—ED.

Lip Stick Holders

We have the problem of finishing a large quantity of small brass stampings that are used in connection with a lipstick holder. These stampings are buffed to a high polish and are made from "rich-low" brass. This is a type of sheet brass that takes a very high gold finish polish in the buffing operation. After the brass parts are buffed they need to be lacquer coated.

In view of the fact that these brass stampings have to be produced in very large quantities, it has been suggested to us that the lacquer be applied in a tumbling barrel, as a means of per-

(Continued on page 93)

forming this operation quickly and effectively. The method appeals to us, but we have no experience with it. Would you be so kind as to supply us with some information on this type of finishing? Possibly an article has appeared in your excellent magazine which describes this operation. If so, we will be very happy to receive some tear sheets describing how this work is done. Also, you may be able to put us in touch with a manufacturer of suitable equipment for this work.—T.P. Co.

It occurs to us that these items could be quickly and economically coated in a dip-whirling machine, such as the one illustrated on page 131 of February 1946 issue.—ED.

Metal Cleaning

In the November 1945 issue of INDUSTRIAL FINISHING we have been reading an article on page 64. In this article we noticed a process called the "CrysCoat Process", and we want to know more about it. We shall appreciate having you refer us to some company who is able to give us complete information on this method of cleaning metal.—C.P. Co.

Answers to your questions appear on page 35 of Feb. 1946 issue of this magazine.—ED.

"Wonder Mist" Wanted

We wish to obtain a small quantity of "Wonder Mist" which is a polish recommended for motor cars, and which is applied by means of a spray gun. Our information is that this material is produced in the U.S.A. and we will appreciate it if you would be good enough to forward the enclosed letter to them?—Air Industrial Developments, Ltd., London, England.

We have forwarded your letter to The Wonder Mist Co., 130 Essex St., Melrose, Mass.—ED.

Finishing Those Small Metal Items

We are writing relative to the inquiry of L. Steel and Wire Co., on page 98 in the January issue, as to how they can finish their particular pieces. If they will send samples to us I feel confident that we can paint these parts much cheaper than they imagine is possible.

It is our business to relieve the manufacturer of the headaches attached to the industrial finishing business, and to do work at a price that is comparable to their own shop cost. We feel we can be a big help to this manufacturer if he gets in touch with us.—Tri Spray Painting Co., Chelsea, Mass.

If the small metal slides and links of the L. Steel & Wire Co. . . . are not perfectly flat, would you ask them to send us a few? If the shape of these items is such that we feel they could possibly tumble, we will ask them to send us a further quantity and will do some experimenting for them without obligation.—Hilo Varnish Corp.

We believe that we can be of help to the L. Steel and Wire Co. in their finishing problem, if you will put us in touch with them. We have had experience with similar parts, handled automatically and semi-automatically. —Enameled Steel & Sign Co.

We are very much interested to see our inquiry printed in the January issue of INDUSTRIAL FINISHING. It also gives us a great deal of satisfaction that your other subscribers appear to be so interested in the other fellow's problems. We have, today, written to the Enameled Steel Sign Co., to put our problem before them directly. With very sincere thanks for your assistance, we are.—L. Steel & Wire.

Graining Steel Cabinets

We are interested in locating a manufacturer of equipment for automatically graining steel cabinets, using the etched copper plate method. The type of grain we want to produce is for walnut and mahogany finishes. We would appreciate your advising us of any source whom we might be able to contact with reference to such automatic graining.—N. Metal Furn. Co.

See the American Richwood Products Co. advertisement which apears in every issue of this magazine (starting with Nov. 1945 issue).—ED.

Voice of Appreciation

INDUSTRIAL FINISHING Magazine for the month of January contained many outstanding products in its advertising display pages. It is through the compiling of statistics such as are embodied in this magazine that many finishing organizations get a chance to see what is going on in other parts of the country and also what products are being offered for their use by manufacturers other than those with whom they deal regularly.

There is a 2-fold reward in this magazine. First, many manufacturing

concerns use the products herein advertised, and advertisers continue to place better and more informative ads, thereby increasing the service which INDUSTRIAL FINISHING magazine can provide to the industry. Why, I know the men in one firm turn to a certain ad—a beautiful feminine character—immediately upon receipt of the magazine. Their organization does around $4,000,000 worth of business annually.

These men look over the book from cover to cover and then scan every article and item presented in it. This group of wide-awake finishing room men have found that through reading INDUSTRIAL FINISHING they have been able to make many cost-saving innovations in finishing technique and material usage. A man is usually judged by the company he keeps. A finisher can be gauged by the magazine he reads.—NORMAN ABRAMOVICE.

Furniture Finishing

We are informed that two or three years ago your magazine carried a series of articles on the finishing of exposed wood parts for upholstered furniture. Are tear sheets or reprints of this series still available? We would like to get all or part of it.—H. Furn.

An article in May 1942 issue may be the one you have in mind. We are sending tear sheets from our last mutilated copy. No reprints are available.—ED.

Offers Holland Chemist Back Magazines

In the January issue, on page 94, you quote from a letter from a Dutch Lacquer Co., written by a Mr. Ed. Vorstman, Tiel, Holland.

I happen to have about 4 years' issues of the American Chemical Society's magazine (the war years) in good condition and it occurred to me that Mr. Vorstman might like to have them, or know of some dutch chemist that would like them. If you think he would, will you please send me his address and title, etc., so I will be sure he stands a chance of getting the package?—JOHN W. NEE.

Thank you for your generous offer. We are advising Mr. Vorstman about it.—ED.

Conveyorized Finishing

We are interested in securing the names and addresses of manufacturers who make overhead conveyor systems suitable for use in the manufacture and finishing of table-model radio cabinets. Any information you can give us will be very much appreciated.—S.M. Co.

Manufacturers and engineers who can furnish what you want, advertise in every issue of this magazine.—ED.

Finishing Furniture on a Conveyor Line

We have read with much interest, in the December number of INDUSTRIAL FINISHING, the article entitled, "Finishing Furniture on a Conveyor Line", written by Walter C. Anderson.

For some time we have been considering the installation of a conveyor line in our finishing room. We produce a little over 1000 units of case goods per week.

We would like to know if Mr. Walter C. Anderson is a consulting engineer on these problems, and if so, could you give us his address, or ask him to write us? If Mr. Anderson happens to be tied up with one company, would you be in position to recommend some other consulting engineers, who would be familiar with finishing room problems, including the planning of a conveyorized layout for finishing furniture?—V. Furn. Co.

Information supplied.—ED.

Fish Lure Painting

Would you please put me in touch with the F.F. Co. (Jan. issue, pages 96 and 98), who is having trouble in finishing fish lures?

I do not know of a dipping machine for fish baits, but it may be that I can help them with their problem in finishing fish baits without a dipping machine. However, before I can suggest anything along this line I must have complete information in regard to their setup, and what type of plugs they are making.—J.N.

Bowling Alley Lacquer

In glancing over your April, 1945 issue, we came across a letter published in the "Letters from Readers" column which was of great interest to us. It was initialed "S.S." and inquired whether you could supply information regarding a bowling alley lacquer, with the correct formulation to follow certain specifications.

In the past few years we have done a great deal of research work on the particular type of coatings they mention and we are now making a product for this purpose. If possible we would appreciate your forwarding us

CRITICAL CONSIDERATION *of our* POST-WAR SHIPMENTS

★

EVERY FORMULA IS REVIEWED IN LIGHT OF WAR EXPERIENCE

DOPES · LACQUERS · ENAMELS

RANDOLPH

Carlstadt **FINISHING PRODUCTS CO.** New Jersey

the name of this subscriber so that we may contact them.—Plastex Adhesive Products, Inc.

Information furnished.—ED.

Who Knows "Ambroid?"

We have a specification calling for "Ambroid" or Glyptol to be used as a sealing agent over a certain assembly. Can you tell us what Ambroid is? Is it a type of lacquer, trade name product, or what? We would appreciate it very much if you could elighten us on this subect.—A. PRODUCTS CO.

These are obviously trade names—and probably indicate synthetic resins of some kind which are incorporated as ingredients in the formulation of certain synthetic or lacquer finishing materials.

In looking over the 1944 and 1945 Trade-Mark Directories of the National Paint, Varnish & Lacquer Association, (1500 Rhode Island Ave., N. W., Washington, D. C.), we do not find the word "Ambroid". However it may be misspelled or it may have been given to them after these directories had gone to press. You might write them in reference to this.

Regarding the word "Glyptol", we believe this should be "Glyptal". If so, it is an alkyd resin manufactured by General Electric Co., Schenectady 5, N. Y.

Referring again to "Ambroid", you might obtain the information you want by calling up some of the leading paint chemists in your city (Milwaukee). They may recognize the name and be able to direct you to the firm that manufactures same.—ED.

Enthone, Inc., Succeeds Enthone Company

Enthone, Inc., 442 Elm St., New Haven, Conn., has succeeded Enthone Co., manufacturers of plating equipment and supplies. The company was operating as a partnership and the corporation has assumed all assets, liabilities and goodwill.

The officers of Enthone, Inc. are Walter R. Meyer, President; J. F. Buckman, Vice-President and Treasurer and Clarence C. Helmle, Secretary.

Dr. Meyer has been actively associated with Enthone since 1942, and was formerly editor of "Metal Finishing". Prior to that he spent seven years with the General Electric Co., Bridgeport, Conn. as electrochemist and metallurgist.

Mr. Buchman was associated with the Enthone Co. since its founding and has been actively engaged in the finishing industry for the past 20 years.

Mr. Helmle has been with the Enthone Co. since 1943 and preceding that time he spent 11 years with the General Electric Co., Bridgeport, Conn. as chemical engineer.

Dehn Becomes Sales Manager for Magnuson Products

Mr. Edward Magnuson, President of The Magnuson Products Corp., manufacturers of industrial cleaning compounds, announces the appointment of Mr. George W. Dehn as Sales Manager. Mr. Dehn has been connected with the cleaning, plating and finishing industry, having traveled through the Mid-West for the past 20 years, representing a large manufacturer of finishing materials. He will be located at the home office of The Magnuson Products Corp., 50 Court St., Brooklyn 2, N.Y.

Stevens and Lord Join Zapon Sales Staff

Appointment of Robert A. Stevens, jr., and Kenneth S. Lord to its expanded sales staff is announced by the Zapon Division of the Atlas Powder Co., Stamford, Conn.

Mr. Stevens, who is assisting in the Stamford office of Zapon on sales work for the New England district,

R. A. Stevens, Jr. Kenneth S. Lord

was employed by the New York, New Haven & Hartford R. R. before joining the Army.

Mr. Lord, a captain navigator in the Army Air Forces, who was discharged Oct. 1, 1945, has been assigned to cover Eastern Pennsylvania as sales engineer. He was employed by Zapon before entering the Army in 1943.

SAVE TIME AT THE FINISH

USE LACQUER

In today's race for markets, lacquer finishes save hours—sometimes days—in starting shipments on their way. Because lacquers air-dry quickly... require no baking... avoid pile-ups and congestion in the finishing room.

Lacquers are not only easy to apply—they harden into durable, beautiful coatings that make industrial products most attractive. Now is the time to SHIFT TO LACQUER... ask any lacquer supplier.

CSC makes no lacquers or thinners but supplies solvents and plasticizers to manufacturers of protective coatings.

CSC

COMMERCIAL SOLVENTS
Corporation

17 East 42nd Street, New York 17, N. Y.

Questions and Answers

Tumble Finishing

Robert Boon's article on "Tumble Finishing" (Jan. 1946 issue, pages 100, 102) is interesting and good. I regret that it was not accompanied by a diagram giving dimensions of the octagon-shaped drum in which so much work was needlessly spoiled. It would be interesting also to have a sketch giving dimensions of the drum which he is now using so satisfactorily.

I agree wholeheartedly with his suggestion that after the drum has revolved about ten minutes the contents should be examined to see what it looks like. That's a sure way to learn.

What does he mean by, "the right side" when he says, "material should always be added to the right side of the drum"?

Successful tumbling is being done both in closed octagon and hexagon drums, and oblique or tilted conical barrels. The things that seem to cause trouble to many people in tumbling are the relationship of shape of the piece, the amount of the load, the number of revolutions per minute, the body of the coating material and how quickly it "sets."

Mr. Boon's article suggests that he observes his tumbling frequently and at varying stages. This procedure has had, no doubt, much to do with his success in tumbling.—W.S.J. (Technician).

What I mean by "the right side of the drum," material should be added to the front of the tumbler, so that when it rotates to the right the material will spread evenly.

In regard to the amount of the load, this is determined by the size of the drum. Drums can be made any size. It depends on the needs of the manufacturer. Also, I notice what you say regarding the shape of the piece to be tumbled. This, of course, will depend on the knowledge of the foreman in charge. He will tell you if the part can be tumbled or not. One must have some practical experience in this type of work. Many times I have seen parts that would not tumble in octagon or hexagon drums but they could be tumbled in Ronci or Barrett tumblers.

On the question of the speed of drums, I would suggest about 50 revolutions per minute. If the drum is going too fast, the material will not spread evenly. This you will notice when you stop the drum to see how your tumbling is going. In regard to materials, I explained this in my article.—ROBERT BOON.

Decorating Metal Waste Baskets

We make household waste baskets of sheet metal. They are oval (more properly elliptical) in shape instead of being perfectly round—and, of course, they are larger at the top than at the bottom.

When we made the baskets of stiff paper, we pasted a colored

If it's a new, different or better industrial finish you want — look to Pratt & Lambert-Inc.

PRATT & LAMBERT-INC.
Industrial Finishes
NEW YORK BUFFALO CHICAGO
FORT ERIE, ONT.

picture on one or both of the more nearly flat sides. Now that metal is again available, we have in mind stenciling a multi-color design or picture on the painted metal baskets. We want to do this with silk screen stencils but do not know how to arrange for screen stenciling the curved surfaces. Can you help us on this?—S. C.

Editor's Note: The following answer, along with illustrations, is submitted by Bert Zahn, a recognized authority on modern screen stenciling.

Here we are confronted with a slightly curved surface. In the glass field silk-screen printing has been used for many years to print circular surfaces such as soft drink bottles, milk bottles, glasses, etc. This requires special machinery and equipment, and close register.

The accompanying drawing marked Fig. 1 shows the basket in place in a section of the table that has been cut open to allow placing the basket under it. On the inside of the basket are arms which hold the basket in place while it is being processed. The screen is not hinged, but rides on upright rods, placed at each of the four corners. On each rod, between the bottom of the screen and the table, a soft flexible spring is used which will easily push down where the squeegee is run on to the one side of the screen, pushing the screen in contact with the basket; and, as the squeegee is run over the basket to the opposite side, that side will then be pushed down to come in contact with the basket.

Rollers could also be used on the inside to turn the basket, but then the screen would have to move with the motion of the basket, the squeegee remaining stationery.

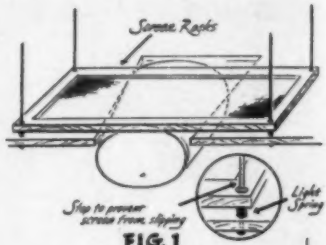

FIG. 1

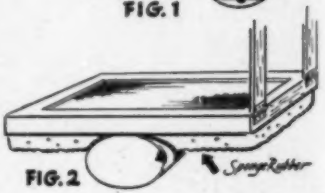

FIG. 2

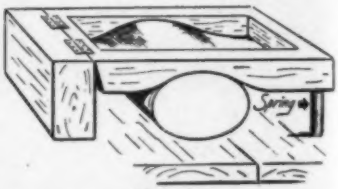

FIG. 3

Three suggested setups for screen stenciling the sides of oval shaped metal waste baskets.

The drawing marked Fig. 2 shows another method wherein a soft sponge rubber cushion is placed on the bottom of the screen, allowing the same action as mentioned in the previous paragraph.

In Fig. 3 you see still another method. Here the wood frame of the screen stencil is cut out to take up the curvature or shape of the basket.

Registration for more than one color is obtained by using the seam on the side of the basket against a permanent stop or guide on the table.—BERT ZAHN.

Remarkable Lowe Brothers Finish Fills Many Finishing Requirements

Adaptable to a wide variety of finishing needs and methods, Lowe Brothers Nu-Spede is an attractive high gloss, weather resisting finish for wood or metal.

Lowe Brothers Nu-Spede, being available in a quality to meet different application and drying specifications, meets the finishing requirements of a great number of products. Trucks, farm equipment, lawn furniture, playground and welding equipment, and many other products will take on a new sales appeal with Nu-Spede finish.

Lowe Brothers Nu-Spede can be sprayed or brushed. It flows out evenly and smoothly. Air-dries, dust-free in 15 minutes—hard overnight. Nu-Spede can be baked in from 30 minutes at 200° to 1 hour at 140°.

Furthermore, Nu-Spede can be applied over Nu-Spede Primer, *after only 5 minutes of air-drying.* This Lowe Brothers application method eliminates between-coat baking and greatly steps up production while lowering the cost of quality finishing.

INDUSTRIAL SALES
THE LOWE BROTHERS COMPANY
DAYTON, OHIO

Lowe Brothers
FINISHES for Industry

Painting Black Bakelite White

We would like to get any information you have available on painting Bakelite handles. We want to paint black handles white, and any information you can furnish us will be greatly appreciated. —G.T.Co.

The Bakelite Corp., New York City, advises us that their "Vinylite" vinyl chloride-acetate resins have been successfully employed for coating "Bakelite" surfaces. Finishes based on the "Vinylite" resins may be pigmented to give the desired color.

The Bakelite Corp. is essentially a supplier of raw materials and furnishes the vinyl chloride-acetate resins, which are used for this application, only in powder form. They state further that a company in Chicago, Ill., has done considerable work in formulating finishes for this type of application and suggest that you communicate with that concern for further information about their products.—EDITOR.

P. S. In a letter, we are giving you the name and address of the Chicago concern referred to by the Bakelite Corp.—ED.

Color Striping Croquet Sets

We have just contracted to take over a defunct factory to complete a contract for making croquet sets. Our analysis indicates a lack of production line painting is the cause of a great deal of the trouble they have experienced.

Could you recommend a manufacturer or give us advice as to how to put six color stripes on goal posts, single stripes on mallets, and 1-in. stripes on balls, either by a roller method or by the use of a spray gun?

We are also interested in the proper conveyor and the use of the proper quick-drying lacquer or an infra-red drying process.—W.A.G.

Manufacturers of these sets declare that this color striping is quite simple. Finished balls and stakes to be striped are rotated slowly in a lathe and the broad and narrow stripes are applied with a hand brush or a coating roller. The turnings can be quickly centered, clamped in position and then released by using hollow cone centers or something similar on both lathe centers.—ED.

Cleaning Insides of Used Steel Drums

May I offer some added comment on the answer to E. Q. C.'s question on "Cleaning Insides of Used Steel Drums", as published on page 108 of Feb. 1946 issue?

Having been pitchforked into the design and operation of a plant for reclaiming used steel drums (55-gallon capacity) for the U. S. Air Forces and other service units early in the war, experience taught me a number of things which are somewhat at variance with the reply made by the editor.

To obtain first-hand information as to what actually goes on inside a steel drum while it is being mechanically cleaned by chains, we picked out the worst specimens we could find, and cut a 6-in. "peep hole" in the upper end. Through this opening it was possible to check the scraping action of various types of chain, and to determine a number of optimum processing characteristics. The

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same plan of cutting open an end of a drum, after subjecting it to what then was considered standard (?) cleaning processes, demonstrated the poor quality of cleaning when a drum was turned end-over-end.

We found that unless the drum was rotated on its axis as the end-over-end turning went on, the chain would not reach much of the area of both ends and sides of the unit. Likewise, unless the end-over-end turning was slow—say about 8 r. p. m. or less—the impact of the mass of chain falling to the lower end tended to drive the links into the steel, and to force apart the junction of end and cylindrical portions. If the speed was increased to above 20-r. p. m., the number of "leakers" increased rapidly.

Technique of Drum Rotation, With Chains

To really clean the ends and side walls of the drum, and also to insure removal of material within the rounded or bulged area of the "hoops", it was necessary to rotate the drum around its axis, at the same time tilting it so that the chain would reach all of the surface of one end; and then, after that was scoured, to reverse the tilt so that the chain scraped the opposite end. For this operation, of course, both bungs were set in fairly tight to avoid loss of our cleaning solution.

The cleaning chains were used with some type of commercial solvent—usually hot—this being put into each drum along with the length of chain; the unit was then rotated. If a hot solution were indicated, we learned that the effectiveness of its cleansing action was considerably stepped up if the drum were also heated before the cleaning job was started.

Since the drums were to be cleaned exteriorly as well as inside, we worked out a combination filling and scrubbing unit which enabled a large part of the cleaning to be done simultaneously, inside and outside. The drums, first emptied of any liquid contents which might still remain, were given a leak test, by being charged with compressed air, and then rotated in a bath of strong soap solution. Care was taken to check both chimes and the entire end area of each drum, so that any leak might be indicated by the formation of bubbles. The air was then bled off, and two cleaning chains were put in to each drum through the 2-in. bung hole.

The drum, with chains inside and both plugs out, was then rolled into the vat of hot (200° F.) solution, being brought to rest on a platform which allowed the drum to fill to a specified height with solution when either opening was rotated to come below liquid level. The bungs were then screwed in tightly, and the drum was revolved around its axis as it progressed through the cleaning vat. This rotation—at a speed adjusted to keep the chain sliding around within the drum instead of bunching and falling—worked loose most of the material around the sides of the drum and this, if the contamination were heavy, was drained out while still in the vat. In this case new solution was added in a second vat or through a hose, and the drum was then placed on a machine which rotated it at an angle suitable to give distribution of the chain's scraping action across the entire surface of the head.

Add Acid to Clean Rust; Then Neutralize it

Where the drums to be reclaimed were rusted on the inside, and

Vitra Carlite—the quick bake synthetic enamel.
Franzite—an air dry or quick low bake synthetic enamel.
Rip-Pls—the superior black wrinkle finishes.
No. 916 Black Crystal—the real sparkle finish.
The Hilo Synthetic Sheet Metal Finishes for roller coat application.
Ready Mixed Aluminum dip and spray, air dry and bake.
Back in the Picture
after five long years

All of the above Hilo Protective Coatings are now available again for civilian use. As in the pre-war past, they live up to the old-established Hilo tradition of making fine products of the best materials obtainable.

A trial lot of 10 gallons of any of these Hilo favorites will be sent on approval.

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if they were destined to be filled with such materials as aviation gasoline after reconditioning, the action of the chain could be accelerated by using an acid and thus, in effect, subjecting the interior to a combination of pickling and scraping. Of course, after using acid, it was necessary to give the drum an inside rinse of a neutralizing solution and then, if the contents were to be petroleum products, to inhibit further corrosion with a fine mist spray of volatile oil. A measured amount of oil was admitted to the spray unit and spraying action was maintained until the unit "broke air".

The various makers of industrial cleaners have sufficient background to be able to specify the type of product which will work most effectively to remove any given contaminent within a drum. But in using any of these cleaners, it is necessary to allow more than the specified reaction time when working within a drum. If a certain cleaner will remove a coating from a flat surface in a certain number of minutes, that time must at least be doubled to insure softening and removal of the accumulation of material which forms in the recess at the junction of drum head and side wall. This narrow crack or cranny will hold enough material to off-grade the refill or, in the case of food products, to impart disagreeable taste or odor, in addition to possible discoloration.

As far as cleaning chains go, more important than the scraping action of any specially formed surfaces or angles is the amount of care which has been expended in designing a non-fouling unit. It is astonishing how thoroughly a trace chain, for instance, can tie itself into hard knots while being revolved around inside a tilted drum. And the untying of these knots, with a pair of "feelers" operated through the bung hole consumes enough time to easily make the difference between profit and loss on the contract price of cleaning a drum.

We discovered that a chain dropped into a drum was four times as likely to knot as one inserted into the 2-in. opening while the drum was inclined at an angle of about 45° from the vertical. We also learned that two short chains were less likely to become knotted than a single long chain.

Removal of the chains was also speeded up by welding a special bridge inside the end links so that they could readily be identified and hooked for withdrawal by the specially formed hooks used for this purpose. Although some engineers advocate the use of chain with special cutting or scraping edges formed on the ends of the links, our experience shows that any gain in cleaning time obtained through such means is more than lost by the increase in time required to untangle the knots formed through the interlocking of these special surfaces.

During the time of the various contracts processed through the plant we tested, cleaned and reconditioned more than a quarter of a million drums, mostly in 14 and 16-gauge, though a few 18-gauge units were processed. We were still experimenting when the contracts were terminated, but were able to show marked gain in speed and quality of work as a result of the steps which I have outlined.—ELTON STERRETT.

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Clover Leaf Paint & Varnish Company
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The Gilbert Spruance Co.
R. H. Thorpe Paint Co.
Tomlinson Paint & Varnish Company
Trojan Lacquer Co.
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U. S. Lacquer & Chemical Company
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Patentees and Licensors

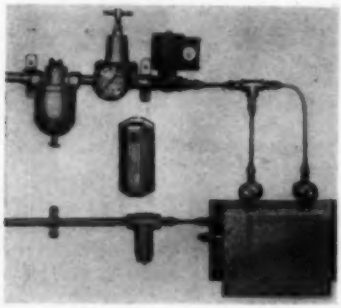
U. S. PATENTS — 1,877,748 — 1,898,247 — 1,930,768 — 1,977,345 — 2,000,120 — 2,000,121 2,093,424 — 2,105,984 — 2,161,503 .

Materials Supplies Equipment

Industrial Humidifying Unit

The new Industrial Humidifying Unit produced by Spraying Systems Co., 4017 W. Lake St., Chicago 24, Ill., introduces a departure from conventional methods in that the entire, compact unit is delivered ready for installation. It produces a finely atomized humidifying spray, is highly efficient, and is unusually low in cost.

Made in two or 4-nozzle units, with humidistat control, nozzles can be set at various angles to increase efficiency of moisture distribution. Siphon type humidifying nozzles are used which utilize compressed air, mixed externally, producing an exceedingly fine, round (full cone) spray.



A complete 2-nozzle humidifying unit.

For detailed information on Spraying Systems nozzles and related equipment, write for Catalog No. 22. This reference catalog lists thousands of nozzle types and sizes for industrial applications.

Flexible Baking Enamel

"Porciflex" is a high grade, unusually flexible baking enamel, announced recently by the H. V. Walker Co., Elizabeth, N. J.

Applied by spray, roller-coating machine, or by dipping, Porciflex is baked at schedules from one minute at 450° F. for sheet metal to 15 minutes at 275° F. for other types of work. It is also well adapted to infra-red baking. This fast drying quality of Porciflex enables a finishing department to spray continuously and thus step up daily output by an appreciable percentage.

Available in clear, black, white and all colors, it makes an attractive appearance wherever used. White Porciflex has a minimum tendency to yellow with age, an important factor in household fixtures. Porciflex has an infinite adaptability, due to its unusually flexible make-up. It will not crack or flake when struck, and will not peel off under normal conditions.

New Protective Coating Solves Corrosion Problems

A new protective coating highly resistant to acids, alkalies, chlorides, oils, brine, oxygen, gasoline and alcohol solutions, called "Cotoid," has been developed by the Lithgow Corp., 333 W. 40th Place, Chicago 9, Ill. This is a recently developed formula based on syn-

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thetic resin—a thermo-plastic—in which its low water absorption and inert properties inhibit corrosion.

The application of "Cotoid" results in a tough, hard, elastic finish, which after air drying or force drying, is tasteless and odorless. It has been found practicable for protecting walls, wood or steel structural work, in food processing plants, wineries, breweries and paper mills. It can be used for coating inside and outside surfaces of concrete, steel or wooden tanks used for corrosive solutions, brines and alkalies. It has been laboratory tested and approved for use with a wide range of acids, gasoline, sour crudes, and lye solutions.

"Cotoid" will withstand a maximum temperature in air or vapor of 220° F. Maximum sumerged temperatures approach 150° F. It will not crack under temperatures as low as 20° below zero F.

Application by spraying is recommended. It can be applied by dipping, flowing or roller coating. A specially prepared "Cotoid" for baking-on process is available.

First Aid Kit

The new Finger-tip First Aid Kit has a number of exclusive features that recommend it to factories and places where groups of people are working. "Unit" packages of dressings and medication for ordinary emergencies are all grouped together where they are in full view for instant selection. "Bulk" surgical dressings and medication for larger injuries are together, also in full view.

The rubber-gasketed steel case is dust-proof and moisture-proof, with an ingeniously designed interior that prevents items from falling out of place. Shelves are undercut and there is space between them so that even stubby fingers can remove any item at once. There are no drawers to rummage through. Even the varisized adhesive tape is mounted on a built-in axle. All materials meet specifications of the U. S. Bureau of Standards and the U. S. P.

Materials may be ordered separately to keep the case adequately filled. Wall brackets, carrying handle, spring locks and ample work shelf help to make this 12-lb. steel-cased kit adaptable to almost every need. No. 5 Finger-Tip Kit is manufactured by Medical Supply Co., 75 W. Van Buren St., Chicago 5, Ill.

Roxaprene Flexible Metal Finishes

Some characteristics of Roxaprene chlorinated rubber base finishes for metal are as follows:

Fast setting; films are out of dust in lacquer time; dry enough to tape in six hours. Air-dry synthetic production schedules are greatly shortened.

Versatile; the same enamels air-dry or bake (1 hour at 180° F., or 30 minutes at 250° F. are typical schedules).

Flexible; they may be drawn and formed into bottle caps and jar caps.

Permanent in adhesion; films over two years old may be bent double without cracking.

Free flowing; they roller-coat and dip without silking or sagging.

Alcohol resistant; 24 hours' immersion in pure spirits will not soften the film.

Salt-spray resistant; films have withstood 6000 hours' continuous exposure to 5% calcium chloride spray.

Chemical resistant; special formulations withstand constant im-

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Ceaseless Vigilance Produces Industrial Whites of Uniform High Quality!

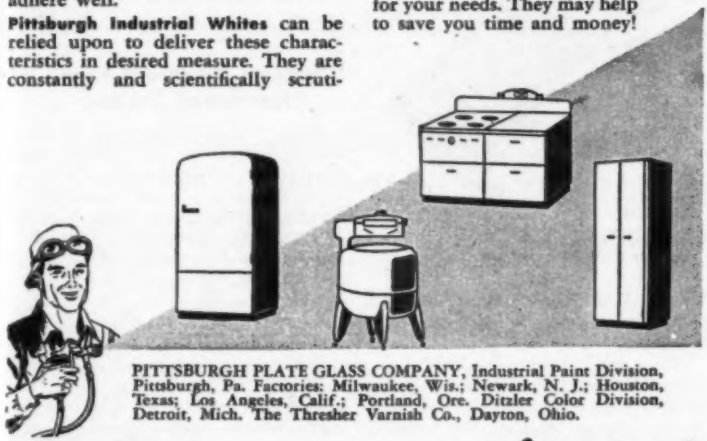
MANUFACTURING precision is essential in the formulation of industrial white finishes for use on household appliances.

They must retain their hardness under baking. They must be smooth and of a desired opacity. They must retain their initial gloss and their color. They must resist grease and humidity and adhere well.

Pittsburgh Industrial Whites can be relied upon to deliver these characteristics in desired measure. They are constantly and scientifically scrutinized both in their formulation and performance in service.

There is no better proof that these coatings measure up to rigid standards of excellence than their continued use by many leaders in the home appliance field.

Ask us for enlightening facts and figures on Pittsburgh Industrial Finishes for your needs. They may help to save you time and money!



PITTSBURGH PLATE GLASS COMPANY, Industrial Paint Division, Pittsburgh, Pa. Factories: Milwaukee, Wis.; Newark, N. J.; Houston, Texas; Los Angeles, Calif.; Portland, Ore. Ditzler Color Division, Detroit, Mich. The Thresher Varnish Co., Dayton, Ohio.

PITTSBURGH *Industrial* **FINISHES**

mersion in, and exposure to continuous spray of corrosive liquids for 600 hours without failure.

Alkali resistant; they eliminate "burning" or blistering when applied over alkaline surfaces.

Roxaprene coatings are products of Roxalin Flexible Finishes, Inc., Elizabeth F, N. J.

Hand Truck for Drums

The new "Handy" steel all-welded truck is especially adaptable for operation in narrow aisles and for picking loads in close quarters. It is manufactured by The Schmidgall Mfg. Co., 307 Cass St., Peoria 2, Ill.

This steel truck has bronze bearings and molded rubber tires

This truck is designed for handling barrels, kegs, sacked material, boxes or crates. Balanced design places load on the wheels, not on the trucker. Single handle makes possible the handling of bulky, heavy loads with one hand.

Optimus Announces New Floor Cleaner

Optimus Floor Cleaner No. 1F10 is announced by Optimus Detergents Co., 208 Church St., Matawan, N.J. This product is a heavy duty floor cleaning compound, especially compounded for use on cement, Terazzo or tile floors.

Although effective in removing oil, grease and other dirts from the surface, this material does not harm the finish in any way. In fact, regular washings with Optimus Floor Cleaner helps to keep floors in good condition, makes them less porous, prevents them from dusting, keeps them whiter and cleaner.

Optimus Floor Cleaner is a base from which a liquid floor cleaner can be made, or it can be applied to the surface directly, and then rinsed off. Used in lower concentrations, it is effective in industrial floor scrubbing machines. Available in 150-lb. and 500-lb. containers.

Cigarette-Burnproof Panels of Hardwood Exhibited

New frontiers for old and new wood products were recently demonstrated to 150 men and women at a meeting of the Washington Chapter of the American Society of Mechanical Engineers. The meeting was held at the wood products development shop and wood chemistry laboratory of the Timber Engineering Co., Washington, D. C.

Autoclaves for impregnating wood, using the full-cell method of vacuum and pressure, and the chemical bending of wood using methylolurea impregnated magnolia and elm, were demonstrated by Robert Blumenstein.

Demonstrations of hardwood

theories don't work anymore

The new industrial age is practical and demands facts.

What materials work?

What will give you results?

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toughness were carried on by Charles Hoffman, wood technologist.

Production of waterproof, cigarette-burnproof wood panels with a hydraulic hot plate press, were exhibited by Herman Knauer, shop mechanic.

Demonstrations of the turning qualities of methylolurea treated and dyed wood were made by C. V. Harlan, wood turner, whose expertly turned ash trays and powder boxes were given to guests.

Industrial Washing Machine

A new engineering achievement in the industrial washing field is manufactured by the Industrial Washing Machine Corp. of New Brunswick, N. J. This new cabinet-contained model, designated as RBM, is adaptable to a variety of metal washing purposes. It quickly, efficiently and thoroughly washes and rinses assorted parts up to 36-in. in diameter and 30-in. high. The RBM is compactly designed to conserve valuable shop space and is completely automatic in operation. This time-saving feature eliminates the necessity of constant attendance, and frees the operator for interim duties.

Products of Tomorrow Exposition Cancelled

Due to the uncertainty of products and delivery schedules of vast numbers of the nation's leading manufacturers the Products of Tomorrow Exposition, scheduled to open at the Chicago Coliseum April 27th, has been indefinitely postponed.

The national production outlook is so clouded that the majority of manufacturers who originally planned to display their postwar products now consider it inadvisable to participate in public exhibits until they are more certain of their future capacity for delivery.

Luster Sealed Finish for Aluminum

Locks of aluminum are now in production at Schlage Lock Co. to lead off the parade of new materials in the building field. The aluminum used in these locks is treated by the Schlage Luster Sealed process, by which they are given an extremely hard surface highly resistant to tarnishing, staining, and the corrosive effects of weathering. They can be installed anywhere, in either interior or exterior locations, with complete confidence that they will retain indefinitely a distinctive satin silver appearance.

This new development in hardware opens many new fields for architectural application of aluminum. Aluminum as a material for trim and building accessories is becoming increasingly popular, and with refinements of finishing now possible, it is expected that this metal will enjoy much wider use. Luster sealed locks will be in complete harmony with this trend, besides affording a beautiful neutral trim to blend with any type of decoration.

The Schlage Luster Sealed process is an adaptation of the Alumilite process, developed by the Aluminum Co. of America for producing extremely hard, corrosion-resistant surfaces on aluminum. To achieve this finish, aluminum for lock trim is treated anodically in a suitable electrolyte so as to secure a dense, adherent coating of aluminum oxide. The aluminum oxide which forms the finish is integral with the surface of the parent metal; it cannot peel, as plated metals, nor is there any protective lacquer or other covering to scratch or wear off.

In overcoming production obstacles to produce a lock that will

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ALUMCOTE

Series of Protective Coatings

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ALUMCOTE SERIES

CODE	TYPE	RECOMMENDED USES & APPLICATION
P-6757 Alumcote	Oleo-Resinous	General purpose metal coating for dip, spray, or brush application for air-dry or bake.
P-9251 Alumcote	Synthetic	Heat resisting metal coating for dip or spray applications, baking type, suitable for service at elevated temperatures.
V-587 Alumcote	Synthetic	Lithographing metal coating for roller coating application. Baking type, produces brilliant finish suitable for fabrication. Subsequent printing operations not recommended.
V-587 M.S. Alumcote	Synthetic	Non-smudge type lithographing coating for roller coating application. Baking type, suitable for fabrication.
V-938 Alumcote	Synthetic	Lithographing metal coating, suitable as a base for subsequent printing. Baking type, for fabrication and steam processing.
V-938 M.S. Alumcote	Synthetic	Non-smudge type V-938. Overcoated with gold lacquer, produces a brilliant bronze type finish.
W-350 Alumcote	Vinyl	Chemical resistant lithographing metal coating. Roller coating application, baking type, suitable for severe fabrication requirements.
057 Alumcote	Synthetic	Flameproof metal coating, spray or brush application. For use on hot surfaces. Interior flue pipes, exhaust stacks, heaters, heaters, etc.
W-516 Alumcote Vehicle	Synthetic	Vehicle for aluminum paper coating application by paper coating machine, flash dry, suitable for embossing. Brilliant finish, useful for decorative food packaging.

Watson-Standard's postwar aluminum finishes, incorporating the latest war proved scientific advances in the field of organic protective coatings, are now available.
Brilliant, smooth aluminum finishes on steel, tinplates and many other surfaces are now made possible with this versatile series. Write today for a copy of the Alumcote Technical Data Folder.

THE WATSON-STANDARD CO.

Manufacturers of
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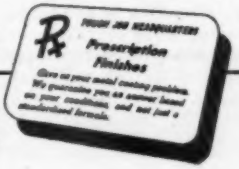

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not tarnish or stain under any normal usage, the Schlage Lock Co. has contributed a new lock finish to enchance the homes and buildings soon to be built with materials improved or developed during the war years.

Flexible Abrasive Disc for Smoothing Metal

Greater economy, increased production, and reduction in operational hazards are reported for the Pekay Flex-Disc, an improved type of abrasive disc for grinding and smoothing metal with portable sanding units. Departing from the conventional form of a single layer of abrasive particles on cloth or paper, the New York Grinding Wheel Corp., 623 Bergen St., Brooklyn, N. Y., has produced a modernized disc which combines greater tensile strength, a wider range of compound mixtures and abrasives, augmented durability, and reduction in the number of operations.

A homogeneous, flexible mass of great strength is produced by curing together three layers of materials—a bonded cutting layer, a cloth layer, and a fibre disc. A tough resilient rubber compound is used to bond the abrasive particles, producing a bonded layer ⅛-in. or more in thickness of grit. The second layer is a cloth of high tensile strength, the third a several-ply tough fibre material. The three layers are held together by a tough resilient cement.

The Pekay Flex-Disc is available with the leading edge elevated, so that a thicker layer of cutting material is supplied at the point of maximum wear. Discs with grits on both sides for grinding in slots and grooves can be produced.

Simultaneous roughing and finishing operations, in many cases, by a single disc of this new type are reported. For example, it has been found that the double operation involving a 36-grit single-layer disc followed by an 80 grit disc can be accomplished by a single bonded-layer 46-grit Pekay Flex-Disc. A similar improvement was noted in some forms of butt welding of stainless and carbon steel. Previously the rough weld was de-burred with a resinoid bonded wheel and finished with an 80-grit conventional paper disc. The combined operation was performed, with a superior finish, by a single ER46-L-93 Pekay Flex-Disc.

These improved abrasive discs are manufactured in any diameter up to and including 18-in. Any desired bore can be furnished. The standard thickness is 5/32-in. Thicker discs can be supplied.

Kelite Paint Remover

A new, remarkably fast, non-inflammable paint remover has been made available by Kelite Products, Inc., Los Angeles, Calif., makers of industrial cleaning compounds. This new material is safe on any metal or hardwood surface and provides the speedy removal of all types of paint and enamel. It is packed in 5, 15, or 55-gallon containers.

Probably the outstanding quality of Kelite N.F. Remover is its amazing speed. Preparatory tests, as well as recent reports have emphasized this. As many as eight coats of paint can be penetrated, loosened and removed in one step, taking no longer than 30 minutes. Unusual cases have been reported where 22 coats were removed in three such steps. Complete re-

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From your Presses and Grinders to your Assembly Lines or Shipping Room.

Hydro Whirl DUST COLLECTORS

METAL PARTS WASHERS AND RUST - PROOFING MACHINES

Hydro Whirl SPRAY BOOTHS

OVENS EQUIPPED WITH THE LATEST CONTROLS AND SAFETY DEVICES

Each playing an important part in eliminating hazards to obtain the Utmost Efficiency and Greater Production

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HYDRO WHIRL DUST COLLECTORS AND SPRAY BOOTHS—INDUSTRIAL OVENS WASHERS AND VENTILATING SYSTEMS

moval of one or two coats can be accomplished in 10 minutes. Removal after penetration is easy, in that paint or enamel can be sheeted off by a pressure rinse.

New Machine Cleans Metal Parts

The Equipment Division of the Magnus Chemical Co., Inc., Garwood, N. J., announces a new small machine for cleaning metal parts in production. It is especially suited for metal working shops whose volume of parts to be cleaned does not warrant the installation of expensive, fully automatic cleaning equipment.

Magnus Aja-Dip, Jr. Cleaning Machine is used in metal working plants for the complete removal of all cutting oil and chips, buffing compounds, smut, abrasives or any other deposits resulting from stamping, drawing, cutting, grinding, burnishing or other operations. Parts are handled in batches of 30 to 75-lbs., depending upon the model of the machine. One full batch of parts can be handled every two or three minutes.

The Magnus Aja-Dip, Jr. cleans by agitation. The parts to be cleaned are vigorously agitated up and down, 72 times a minute, in the cleaning solution. Agitation, plus the action of the cleaning solution, "shears" the dirty deposits from all surfaces of the parts.

The Magnus Aja-Dip, Jr. can be used with any type cleaning compound, alkaline, petroleum spirits, emulsifying agents and chlorinated solvents. It may be used with hot or cold solutions. If heated, heating may be by either electricity or gas.

The Magnus Aja-Dip, Jr. is available in two sizes. Either of the two models can be supplied with built-in rinse compartments which may also have the agitation feature if desired.

Magnus Bulletin No. 200-AJ completely describes the Aja-Dip, Jr. Cleaning Machine.

Paratex Paint for Concrete, Steel

Lime is present in every concrete surface. It is a basic element of Portland cement. Lime is also present in some types of brick and in the mortar used for cementing the brick. The lime itself is harmless enough until contact with moisture. Moisture and lime are very active chemically and have, therefore, usually contrived to ruin paint, especially paint on grade or below-grade, cement floors.

The substitution of a rubber-type base in paint instead of the customary oleo-resinous base was quite a revolutionary step. Vegetable oils react with lime and moisture to form a soapy mess. Rubber resin in paint does not form a soap with lime. For this reason Paratex floor paint represents an advance in the concrete floor paint field. It is now possible to paint a concrete basement or outdoor porch floor without the hazard of the paint powdering off.

During the war, due to the curtailment of rubber products, it was not possible to make Paratex rubber-base paint. Now, however, chlorinated rubber supplies are back and Truscon Paratex concrete floor coating is again available.

Paratex is also adaptable to steel protection. Steel, because of its great susceptibility to rusting, needs the highly waterproof qualities of the rubber resin in Paratex

SEA-LAC

for EVERY COATING PURPOSE

PROVED IN WAR!
IMPROVED FOR PEACE!

All through the war, SEA-LAC finishes were called on for all kinds of service. As specialists, we had the know-how to make good . . Now, with our war-gained findings, we offer for peacetime purposes improved finishes for every coating purpose . . Tell us your need and learn how we can serve you.

DURALAC CHEMICAL CORPORATION
LISTER AVENUE, NEWARK 5, N. J.

and its high resistance to chemical change. For these reasons, Paratex is effective in protecting iron and steel from rusting. It is a product of Truscon Laboratories, Inc., Caniff and Grand Trunk R. R., Detroit, 11, Mich.

L. S. Knouse, Sales Manager of Stanley Chemical Co.

The Stanley Chemical Co., East Berlin, Conn., announces the appointment of Mr. L. S. Knouse as Sales Manager, with complete responsibility for the sale of all industrial coatings.

Mr. Knouse graduated from Pomona College, Claremont, Calif., in 1929 and immediately became associated with The Stanley Works, New Britain, Conn. After working in the Shipping Department for a short time he entered the Cost Department. In 1931 he became a member of the Sales and Marketing Research Division, and shortly thereafter became Sales Research Manager. In this position he traveled extensively, contacting a wide variety of companies determining the marketability of proposed as well as old products.

In 1939 Mr. Knouse was made Sales Manager of one of the affiliated companies of The Stanley Works and did an outstanding job.

In 1941 he returned to the Ordnance Hardware Sales Division of The Stanley Works where he was responsible for the scheduling sale of certain small arms ammunition requirements. Following the termination of the war, he had charge of the disposition of government owned inventories of equipment and parts.

Maas & Waldstein Co. Training Program for Service Men

An intensive three months' training program, designed to furnish opportunities for advancement to former employees returned from military service, has been initiated by Maas & Waldstein Co., Newark, N.J., manufacturers of industrial finishes.

The program, which was conceived and launched by Gustave Klinkenstein, vice-president of Maas & Waldstein, stresses sales training. It begins in the company's laboratories, where the trainee learns from experienced chemists about the processes involved in the manufacture of lacquers and synthetic enamels and the principles of color matching and product finishing. After he has been given these fundamentals, the trainee goes on to office and field experience, under the direction of technical service and sales engineers.

Schaefer Varnish Co. Puts On More Salesmen

Mr. T. F. McGuire, president of the Schaefer Varnish Co., announces that Mr. Marvin L. Hoover, of Salamanca, N. Y., has joined the Schaefer Varnish Co. sales organization. Mr. Hoover was formerly superintendent of finishing for the Jamestown Table Co., and is doing sales and service work for the Schaefer Varnish Co. in the East. He is also assisting their eastern representatives, Mr. Frank Chichester and Mr. H. W. Vaughn, who are well known to New York and Pennsylvania manufacturers.

In the Carolinas, Mr. W. B. Colbert, formerly superintendent of finishing for the Hickory Chair Mfg. Co., has joined the Schaefer staff and is assisting Mr. Oscar A. Yokes their representative down that way.

Direct Trade Sales for American-Marietta Co.

Martin J. Monahan has been named technical director of all trade sales divisions of the American-Marietta Co., according to an announcement by Grover M. Hermann, president. A

M. J. Monahan, technical director of trade sales, for American-Marietta Co.

member of the technical staff since 1929, Monahan will be responsible for the coordination and standardization of the trade sales items of the various A-M plants. Monahan, who is located at the Kankakee, Ill. plant, is a graduate of Newark Engineering College, receiving his B.S. degree in Chemical Engineering in 1926 and CH. E. degree in 1928.

SMOOTHIE SAYS:

S·I·P

WEAR MASTER FINISHES
stand for
HIGH QUALITY FINISHING

WEAR MASTER Finishes do triple duty . . . As a stimulant to lagging production schedules with their excellent working qualities, a customer-getter for your product with their richness and beauty, and a customer-holder with their durable, long-wearing protective qualities.

WEAR MASTER LACQUER SEALER No. 1999

Excellent sanding qualities. Forms a perfect bond for succeeding coats and contributes to a film of lasting beauty.

WEAR MASTER TOP COAT LACQUER No. 2002

A high solids top coat lacquer with exceptional cold check resistance. Good build and flow makes this lacquer outstanding for quality furniture finishing. Available in gloss or dull sheen.

S-I-P CLEEN-UP POLISH

Whisks away dust, dirt, finger prints and rubbing compound. All this, our friend Digby adds, without fuss, bother or hard rubbing!

STANDARD INDUSTRIAL PRODUCTS, INC.

TRIAL SAMPLES

of these products are available on request. The properties of WEAR MASTER Lacquer and Lacquer Sealer may be altered to meet your specific requirements. Write today.

EVANSVILLE 4, INDIANA

Booklets Catalogs Circulars

Plastics Book Free

A new 24-page booklet contains interesting information and many attractive pictures, all of which have to do with Bakelite laminating plastics and varnishes. Page size is 8½x 11-in. For a free copy, write Bakelite Corp., 30 E. 42nd St., New York 17.

Cleaning Data Sheet Offered Free

MacDermid Incorporated, Waterbury 88, Conn., has recently published a data sheet on a new product for the electrocleaning of copper buffed articles prior to any finishing operation. This data sheet gives typical cleaning cycles for the proper cleaning of any copper coated article.

Catalog of Books

A new catalog of technical books has just been issued by The Chemical Publishing Co., Inc., 26 Court St., Brooklyn 2, N.Y. This catalog includes the latest books on chemistry, physics, science, technology, medicine, foods, formularies, drugs and cosmetics, engineering, metals, technical dictionaries, building construction, etc.

Chemical-Resistant Paint

Complete information on the new "Pen-Kote 500" chemical-resistant maintenance paint is given in an illustrated 4-page bulletin announced by Peninsular Chemical Products Co., 6795 E. 9-Mile Road, Van Dyke (Detroit), Mich.

Illustrations of typical jobs show how this quick-drying, odorless protective coating is readily applied to heated, wet, and porous surfaces of all kinds. Unretouched photographs of test strips demonstrate the protection provided by a single coat of Pen-Kote 500 against hot acids, alkalis and water. Other distinctive features are explained in detail.

Federal Specification for Paint Oils

Seven typewritten pages on the subject: "Proposed Federal Specification for Oil: Linseed, Heat-Polymerized (for) Paints, Varnishes and Enamels", has been prepared by E. F. Hickson, Chairman of Technical Committee on Paints & Varnishes, Federal Specifications Board, U. S. Department of Commerce, National Bureau of Standards, Washington, D. C.

This draft was prepared after carrying out laboratory examinations of samples of heat-bodied oils received from producers. Copies of the draft are available for distribution.

Sanding Booklet Free

A new booklet that explains the merits of the Sterling 1000 portable electric sander can be obtained by writing to Sterling Tool Products Co., 365A E. Ohio St., Chicago 11, Ill.

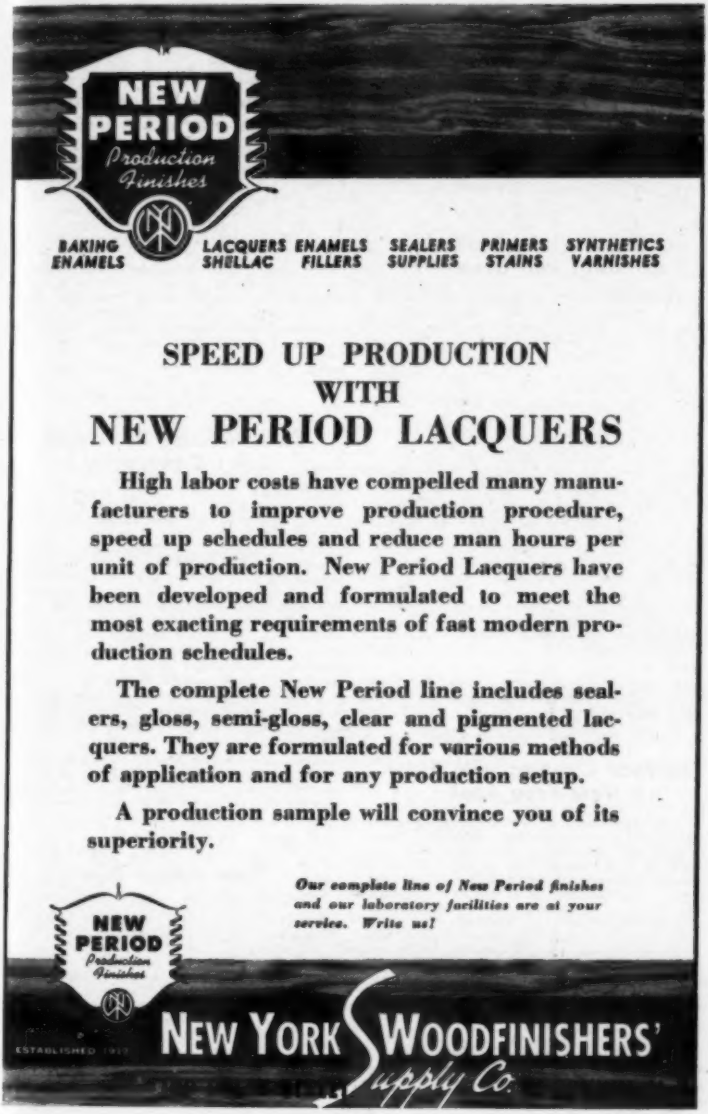
How to Use Masking Tape

No. 4 issue of "Industrial Review", as now published by Industrial Tape Corp., New Brunswick, N. J., contains 16 pages 8½x11-in. which describe and illustrate the how, why, when and where of using various industrial tapes including masking tape. Here is something so instructive, authoritative and up-to-the-minute that every user of paints or finishing materials should have a copy.

Standard Color Designation

General Printing Ink Co., Division of Sun Chemical Corp. has issued a 16-page booklet in which is presented a visual interpretation of the Inter Society Color Council-National Bureau Standards method of Color Designation.

It is a well known fact that there is vital need for uniform methods and standards in color measurement and specification. In recognition of this need, the simple use of everyday words as a key to color appearances was the objective of the ISCC-NBS method described in this booklet. The text is amply illustrated and so writ-


NEW PERIOD
Production Finishes
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LACQUERS SHELLAC
ENAMELS FILLERS
SEALERS SUPPLIES
PRIMERS STAINS
SYNTHETICS VARNISHES
SPEED UP PRODUCTION WITH
NEW PERIOD LACQUERS
High labor costs have compelled many manufacturers to improve production procedure, speed up schedules and reduce man hours per unit of production. New Period Lacquers have been developed and formulated to meet the most exacting requirements of fast modern production schedules.
The complete New Period line includes sealers, gloss, semi-gloss, clear and pigmented lacquers. They are formulated for various methods of application and for any production setup.
A production sample will convince you of its superiority.
Our complete line of New Period finishes and our laboratory facilities are at your service. Write us!
NEW PERIOD
Production Finishes
ESTABLISHED 1917
NEW YORK WOODFINISHERS' Supply Co.

ten that the reader can easily grasp the relationship between words and color forms.

It is easy to understand that as the acceptance of this method becomes widespread, America will eventually have a practical language for color.

A copy of the ISCC-NBS method of Color Designation is yours for the asking. Address your request to the Advertising Department, General Printing Ink Co., Division of Sun Chemical Corp., 100 Sixth Avenue, New York 13.

Nox-Rust Protective Coatings and Cleaners

An attractive printed catalog of 20 pages 9x12-in. describes and illustrates a line of rust-preventive coatings (permanent and removable) and metal cleaners. Quoting from page 1:

"Moisture laden air, noxious gases, fingerprints, acids and corrosive chemicals are the insidious promoters of rust. Each of these enemies of metal requires special agents, scientifically blended, to overcome their rust promoting effects. Nox-Rust is the result of intensive scientific research leading to the production of special agents to provide definite prevention against rust.

"Depending upon the type of application required, Nox-Rust coatings vary in degree of hardness and other physical qualities. Nox-Rust liquid rust preventives are either a solvent or oil-type material whose flash points meet all approvals of the Fire Underwriters, and contain non-toxic petroleum chemicals so that liquid Nox-Rust products can be used without special spray booths."

A copy of the catalog can be had by writing Nox-Rust Chemical Corp., 2423 S. Halsted St., Chicago 8, Ill.

"Surface Coating with Flock" New Free Book

"Surface-coating with Flock" is the title of a descriptive booklet, size 8½x11-in. in colors, just released by Rayon Processing Co. of R. I., Inc., manufacturers of printing and coating flock. Explaining that flock "consists of finely cut particles of synthetic, vegetable or animal fibers", the text goes on to point out how these particles of cotton, rayon and hair may be adhered to any type of surface to produce coatings with the appearance and feel of suede leather, velvet, velour, fur, mohair, felt, carpeting, etc., in all colors.

Swatches of flocked materials, with illustrated examples of applications to many products are included. Directions for applying flock are also given. Copies are available upon request to Rayon Processing Co. of R. I., Inc., 1020 Tremont St., Central Falls, Rhode Island.

Technical Bulletin on Gas Alarm System

A new Technical Bulletin No. 1116E, has been issued by Davis Emergency Equipment Co., Inc., 45 Halleck St., Newark 4, N.J., on the Davis Combustible Gas Alarm System, a method for detecting and giving audible notification of hazardous gas or vapor conditions sometimes present during industrial processing operations. In its eight pages 8½x11-in., this bulletin describes the various combinations possible with this system, together with photographs showing the control panel, which is placed in a gas free area, and the explosion proof analyzer head which detects the presence of combustible gas or vapor at point of origin.

Yarnall Paint Co. Holds Sales Convention

A 3-day sales convention of the Yarnall Paint Co. was held February 11, 12 and 13 at the General Offices of the company, Philadelphia, Penn.

Wm. McKnight, President of the company, discussed the raw material situation and B. F. Swackhamer, Vice-President in charge of sales presented the company's sales, promotion and advertising plans for the year. The third day of the meeting was turned over to a discussion of individual territorial problems with the out-of-town members of the sales force.

Henry Hatton covering New Jersey, was presented with a service pin with one diamond for 15 years service with the company.

The men welcomed back William Wright, who, after serving three years in the Army, has returned to the company. Mr. Wright was also presented with his 15-year service award.

Kam Kathju Dies

According to a news report from Detroit, funeral services were held for Kam N. Kathju on Tuesday, Feb. 19.

Mr. Kathju was well known as a paint and lacquer consulting chemist. He was formerly with Ford Motor Co., Cook Paint and Varnish Co., and the Arco Co. Years ago he wrote a few articles for INDUSTRIAL FINISHING.

Mr. Kathju was born in India, but received his university education in this country. He leaves a wife and daughter.

Just the material *for your postwar finish!*

Cannot be marred or scratched — just thumb nail it; try to scratch or mar it.

MAR PROOF LACQUER

Yes, here's just the material for your postwar product finish . . . a tough piece of goods that will stand up under the most severe conditions. Protects as no ordinary lacquer will do! It produces a splendid transparent finish of full depth on maple, walnut, gum, mahogany and other cabinet woods. Available in either the clear Gloss Rubbing or the Satin Finish. Mar Proof Lacquer Sealer is recommended with it for the first coater.

Test Mar Proof Lacquer on your own product—that's all we ask. Working samples free upon request.

THE SCHAEFER VARNISH COMPANY
LOUISVILLE, KENTUCKY

Industrial FINISHING

Distributed monthly to finishing room and paint shop foremen, production superintendents and company officials of metal-working, woodworking and miscellaneous industrial plants where production cleaning and finishing are major operations in parts and products manufacture.

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(No subscription solicitors are employed)

Editorial

Your Labor Problem Must Be Faced

★ The most important item in a finishing department, as well as in any type of manufacturing business, is labor. To my way of thinking, unless labor is placed in a position where it earns enough money to make a decent living, with enough left over for emergency bills, it isn't going to be happy, and the result will show in your product. There are certain hazards to any job, and pay rates should be arranged to make it worth while for the man who does the muscle work and takes the physical risk, just as rates of pay or earnings should be worth while for the man who supplies capital with which to start labor working.

We have seen the expensive lessons which both capital and labor have given to this country. It is indeed a wise manufacturer who has the foresight or tactfulness or luck to avoid being "burnt" in the fire. Any boss can be bull-headed, and any labor man can also be bull-headed. As a matter of fact, the easiest thing is for them to get started in an argument in which they are both right and both wrong.

Capital, in order to continue functioning must have labor, and labor can't earn money by working unless there is someone who will invest money in an enterprise in which labor can do its skillful work. Whether you are a multi-millionaire or a porter, you labor on the job, and both of you are laborers in different categories. One has invested money and brilliant brains and unending vitality and energy in an enterprise, while the other has invested his muscle and body power. Both have certain responsibilities and both must live in the same world. The sooner

★ Guest Editorial . . . Many readers can write an excellent editorial — two or three paragraphs that present a timely suggestion or valuable idea which will stimulate real thought on a live subject. The Editor welcomes guest editorials and pays for those that are published.

Get this book: showing how *Flock* transforms any material to the appearance and feel of

SUEDE • VELVET • VELOUR
FELT • MOHAIR • CARPET

FUNCTIONAL USES

Used in the auto, airplane, radio, electrical, phonograph, ceramics, furniture and many other industries for

SOUND DEADENING • TEMPERATURE INSULATION • INTEGRAL GASKETS • SHOCK ABSORBING SURFACE • NON-MAR SURFACE • NON-GLARE SURFACE.

DECORATIVE USES

Applied in various lengths and colors to wood, paper, cloth, metal, etc., the following effects are produced—

SUEDE LEATHER • FURNITURE UPHOLSTERY • INTERIOR AND DRAPERY FABRICS • VELVET • VELOUR • MOHAIR.

Rayco Flock makes possible the production of synthetic surfaces in the manner that synthetic yarns and plastics have replaced and improved upon other methods. Made in many types, lengths and colors, flock can be adhered to practically any material, either over-all or in selected areas, to produce the effects listed at the left. Call upon our engineering advice.

REQUEST ILLUSTRATED COLOR BOOK: "SURFACE COATING WITH FLOCK"

RAYON PROCESSING CO. of R.I. INC.

88 TREMONT ST., CENTRAL FALLS, RHODE ISLAND

Developers and Manufacturers of Printing and Coating Flock

GRAINING PLATES
bring out the
QUALITY *you*
have built in
YOUR PRODUCT

AMERICAN RICHWOOD PRODUCTS CO.
(FORMERLY AMERICAN ELECTROTYPE CO.)
Graining Plate Division
184 E. MASON ST. MILWAUKEE, WIS.

MIRACLE
5 Gallon
BLUE
BOY
Model

PAINT REJUVENATOR

Restores Paints, Lacquers, Enamel Products and Pigment Primers, to original consistency in 3 to 10 minutes without opening the can. Available for Round or Square 5-gallon cans. Explosion proof electrical equipment if desired. Also other units from ½-pint to 50-gallon drum capacity available. Originators of Paint Rejuvenating Equipment—ten years—thousands of satisfied users.

Miracle Paint Rejuvenator Co.
127 E. 9TH STREET ST. PAUL, MINN.

each one tries to go out of his way a tiny wee bit to help the other, the sooner they will be able to understand each other better. It takes big men to be able to give in a little and compromise. . . .

Between two great powers, each trying to cooperate and make the other's short span of life a bit more enjoyable, there can be a major contribution toward alleviating labor-management wars, with their loss of pay, loss of profits, and loss of happiness.—N. A.

Prefrabicated House Furnishings

★ Alert manufacturers will take notice. Straws in the wind indicate a definite trend toward prefabricated or packaged houses. Some of these packaged houses are already on the market and as production is stepped up, more will follow.

The whole public is housing concious. Publicity given this subject by practically all magazines and newspapers, the radio, and one's friends leaves no doubt in any intelligent person's mind as to the crying need for homes. Whether or not you personally believe in prefabricated houses makes little difference. People will buy and erect these houses as fast as manufacturers make them available.

Yes, they are small if you compare them with the houses built prior to World War I, with their large rooms and high ceilings, but this new type of compact house is very livable. A typical line offers houses with average size living room, 16x12-ft., bedroom 10x12-ft., and kitchen 8x12-ft., etc., with built in features.

House furnishings, furniture and built-in equipment will be needed,

Motivating...

An important factor which motivates prospective buyers to choose a product is the *correct finish*... a finish which compliments design ... accentuates detail ... yet acts as a protective surface.
If the finish you are now applying to your product doesn't do this two-fold job of enhancing its inherent qualities and providing a protective covering, we suggest you contact our Creative Studio. Our staff of artists are skilled in conceiving finishes which meet particular needs. They have the "know-how" and facilities to design an appealing and durable coating that will make your product more sales-tempting than ever. Reputable firms are invited to take advantage of this service at no cost or obligation.

No Tampering with Quality

ROCKFORD VARNISH *Company*
ROCKFORD, ILLINOIS

Manufacturers of Protective and Decorative Coatings

and while some items now on the market may be used in these newer and perhaps smaller homes, redesigned equipment produced with an eye to compact attractiveness will fit into the picture to greater advantage, as well as make for continued sales appeal. People like to buy and use equipment designed especially for their own particular possessions.

It is said the prefabricated house is designed to sell at a price commensurate with a weekly income ranging from $25 to $60, and in this country, that is some potential market.—B.A.

NORMAN ABRAMOVICE
Finishing Department Consultant
Specializing in
INFANT—JUVENILE FURNITURE
and
BABY CARRIAGE PROBLEMS
311 F St. Martinez, Calif.

PAINT OVERSPRAY
From water curtained spray booths
Will purchase or reclaim
MECKLER CHEMICAL CORPORATION
3748 E. 91st St.
Cleveland, Ohio

For Faster, Better Drying, Baking
NALCO
INFRA-RED LAMPS

For low-cost, speedy, thorough uniform drying and baking. Installed singly, in pairs, in groups or in banks.
Send for bulletin, "Drying Problems Made Easy."
North American Electric Lamp Co.
1030 Tyler St. St. Louis 6, Mo.

Get *All* Paint From Every Container

★ Tons and tons of valuable paints, such as lacquers, varnishes, enamels, primers, etc., are wasted daily. The known and visible source is via the spray booth exhaust. This is noticeable at all times, but compared to others it is small. There are other sources of loss that escape the attention of all but the very ultra-concientious formen and supervisors. In 80% of the finishing rooms, most of the paint containers are not thoroughly agitated to really mix the contents up to formula and laboratory plans for efficient coating performance of any given material.

The results are, in many cases, the loss of profit on closely figured finishing jobs. Extra material had to be used to make up for what was wasted. Not content with having failed to properly stir the paint in a container, the sprayer will proceed to open a new container and discard the old one with 2-in. or 3-in. of good heavy live material remaining in the bottom. It will be deposited on the outgoing junk pile that same night. To anyone who doubts this, I suggest that you look into the containers that have been placed in the rubbish pile. I will be very much interested in hearing from some readers and learning what their findings are.

To save paint and at the same time keep it in better condition for use, it is a wise move to install agitators of a capacity in accordance with the size of containers used. There are agitators on the

. . . the brighter, smoother FINISH
THAT ADDS "Sales-appeal" to METAL PRODUCTS

SUNBRITE

SUNBRITE Metallic Paste Pigments produce a smoother and brighter finish that adds new beauty and sales-appeal to all kinds of metal products.

All metallic shades . . . covers more square feet per gallon and AT NO EXTRA COST.

Let us send samples for your own testing and comparison.

SUNBRITE MANUFACTURING CO.
formerly The Mitchell-Mayer Co.
3506 Market St. ST. LOUIS 3, MO.

SUNBRITE METALLIC PASTE PIGMENTS

Patent Number 2,353,058

Mac's FASHION FILLERS & STAINS

AT THE RECENT Furniture Show Mac's Fashion Finishes on some of the bedroom and dining room suites attracted considerable attention and much favorable comment.

Mac's Fillers and Stains gave these suites a color that possessed unusual life which greatly enhanced their attractiveness.

A color matched sample panel will demonstrate the difference. Write today.

The Lawrence-McFadden Co.
Headquarters for Fine Finishes Since 1875
7430 STATE ROAD PHILADELPHIA 36, PA.

market that can agitate any size container—whether it is a single quart can, a 5-gallon container, or a 55-gallon drum.

These agitators are constructed well and pay for themselves by thoroughly mixing your liquid dollars, so you get 100 cents on every dollar's worth of paint mixed. I have seen excellent agitators in various sizes advertised in this magazine. Let's give this point some thought, follow it with action, and you will save considerably on all finishing materials used.—A. NORMAN.

MISKELLA
INFRA-RED OVENS & APPLIANCES
INSULATED · REFLECTIVE · SECTIONAL
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Accepted Standard
For Furniture and Cabinet Makers
Also Interior Woodwork Recoloring
L. R. van Allen Co.
Patent Licensee
CHICAGO 54

Rosin Important to Industrial Finishers

★ It was pleasant news to paint manufacturers and consumers when restrictions on the use of rosin were removed recently. It is hoped that this basic material will remain free and available from this time on, although there are some who say that rosin and its derivatives will be in short supply for many months.

Readers of INDUSTRIAL FINISHING may be interested to learn where rosin and its compounds fit into the finishing materials picture. In lacquers, rosin finds use in the widely popular ester gums, the hard maleic alkyds, and in the preparation of plasticizer. Varnishes based on modified phenolic resins, ester gums, hardened rosins, maleics and associated types—are all dependent on the pine resin. Many alkyd resins, both the air-drying and baking types, contain rosin as an essential ingredient.

Rosin is commonly used in some types of tape adhesives. Several organic pigments, normally difficult to disperse, are made easier to use by coating each pigment particle with a minute film of rosin. The resinate driers, long used to hasten the oxidation of paint films to the dry state, are prepared from rosin and various metal salts.

It can be seen, therefore, that rosin is basic for the finishing fields. In one form or other it finds its way into a goodly percentage of coatings today.

The discordant note in the present overall setup is that abundant rosin requires abundant vegetable oils for the manufacture of paints, varnishes and lacquers. Unfortunately, these oils are currently scarce.—M.A.G.

Random Comment on the Industrial Scene

(Continued from page 8)

and above amounts needed to meet current requirements.

Wardwell adds that export shipments are a further important factor, and will continue to loom large for at least a year or two. For all these reasons, he believes that limited controls on rents and essential scarce commodities will undoubtedly continue, even if the OPA should be liquidated.

* * *

We Must Buy—Export officials constantly emphasize the theme that trade is a 2-way street, and that Americans must understand the necessity for buying the products of foreign countries, in order to give people abroad the funds with which to purchase our goods.

We must bear in mind, says Alexander Mitchell-Innes, of the London office of J. Walter Thompson Co., that there are certain foreign products which are superior to American items. As examples, he cites English wool, Scotch whiskey and French wines.

Another view of exporting problems is presented by the Australian Government Information Bureau. Lloyd Clarke, of that office, emphasizes the fact that markets which were formerly wide open have learned to manufacture such articles as automobiles, airplanes and textiles. He cites his own country as a vivid illustration. In other words, the pre-war rules will have to be revised in many cases.

* * *

Diesels Are Coming—The great advance chalked up in the field of diesel engines was pointed up recently by Bert Pierce, the celebrated auto expert, in this vigorous

Leakproof Air Blow Gun

Use this gun for blowing dust, dirt or lint from the surfaces of parts and products to be coated with paint or any other kind of coating. It will improve your finish tremendously.

Also useful for blowing out moisture or other entrapped liquid from crevices, seams or indentations in parts to be cleaned or painted.

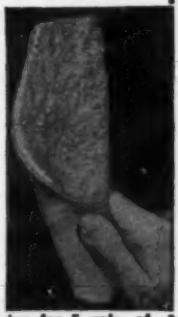
Fits comfortably in the palm of hand. Has button control air valve. Special composition washers prevent leakage. We can furnish any type nozzles—round, pointed, flat or 10-in. extension. Nozzles are interchangeable and renewable. Every plant should have one or more. Write us!

G. M. MANUFACTURING CO.

Engineers, Mfrs. of Complete Spray Equipment

216 N. Clinton St. Chicago, Ill.

LOOK AT THAT!



"That" is a load of overspray 3/8" thick, STRIPPED off a booth whose walls were protected with DOSTER BOOTH KOTE. It keeps booth walls clean. Does not powder or flake.

JUST DAUB IT ON And, when loaded with overspray deposit—

JUST STRIP IT OFF as easy as peeling a banana.

Stop worrying about your spray booths—send in today for 5 gals. of

DOSTER BOOTH KOTE

and prove its economy and superiority.

5 gallon Pails at $1.25 per gal. F. O. B.

DOSTER & CO.

4840 W. Superior St., CHICAGO 44, ILL.

PREVIEW OF SURFACE WEARABILITY

The TABER ABRASER quickly reveals wear resistance in *advance*

In your own laboratory you can measure surface durability of paint, lacquer, plating, textiles, leather, rubber, metals and other materials. Used by hundreds of America's leading industries.

YOURS on request — Manual explaining fully the Taber Method and the reasons why it pays to pre-test. (Also included — brochure on stiffness and resilience testing with the Taber V-5 Stiffness Gauge.)

TABER INSTRUMENT CORP.
111-1F Gaundry St.
North Tonawanda, N. Y.

The Taber Test *Proves* What Wears Best

Detroit
HANDY 'TAC' RAG

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An outstanding quality Product for 9 years. your INSURANCE POLICY for a perfect Mirror-like finish. Protect the dollars spent on Paint and Labor, for just a few cents, by using DETROIT HANDY 'TAC' RAGS to guarantee a perfectly clean, dirt and dust free surface. DETROIT HANDY 'TAC' RAGS remain soft and tacky indefinitely, never dry hard or stiff. Always ready for instant use. Spontaneous Combustion Proof.

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DETRO SALES CO.
414-416 NORTH SAN PEDRO STREET
LOS ANGELES 12, CALIF.

statement: "The diesel entered the global conflict on a par with a rear-rank private, and advanced from echelon to echelon until it rated about all the brass to which a power plant may aspire."

With many diesel-powered trucks and buses already on the road, it is expected that diesel-power passenger cars are now within sight. It is true that some refinements are still needed—such as simplification, weight-reduction, and improved fueling and lubricating methods.

Progress made in diesel design during the war is nothing short of astounding. One horsepower for 2½-cu. in. of displacement compares with 29-cu. in. before the war. Weight has been reduced on an average to 4-lbs. a horsepower against 60-lbs. One remaining problem is the elimination of excessive vibration and noise.

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For Readers — Subscribers to INDUSTRIAL FINISHING may obtain free tickets to many leading radio programs upon request. When planning a trip to Manhattan, drop a line to: *Lawrence H. Singer, New York Correspondent, 130 West 86th Street, New York 24, N. Y.*

Among the cooperating sponsors are: Philip Morris Cigarettes ("Holiday and Co."); America's Town Meeting of the Air (over the American Broadcasting Co. network); and Guy Lombardo's Orchestra.

Honor 50-Year Service Men

Roscoe C. Aber and Lewis B. Vreeland were honored recently at a "Golden Jubilee" banquet given by their fellow employees of the Finishes Division of Interchemical Corp., at the Essex House, Newark, N.J.

Fifty years ago these two men—still hale and hearty and taking an active part in business—joined the Murphy Varnish Co. for a 3-week trial period.

R. W. Goral to Represent Enthone, Inc., in Connecticut

Raymond W. Goral of Bridgeport, Conn. will represent Enthone, Inc., 442 Elm St., New Haven, Conn., manufacturers of plating equipment and supplies, in Southern Connecticut.

For the past four years Mr. Goral served in the Tenth Weather Squadron of the U. S. Army, spending most of his time in India and China where he held the rank of Captain. Previous to this, he spent four years with Underwood Corp.

Ray W. Goral represents Enthone, Inc. in Connecticut

E. H. Christ Heads New $200,000 Coatings Firm

Formation of a new $200,000 corporation to manufacture and sell specialized industrial coatings, lacquers and technical finishes was completed on February 1 by Edward H. Christ of New Britain, Conn. At the same time, Mr. Christ announced his resignation as vice president, general sales manager and director of Stanley Chemical Co.

The new company will be known as the Chemical Coating Corp., with general offices in New Britain. A new plant to fabricate the materials is planned for this locality immediately. The corporation has a capital stock of $200,000 and starts business with $100,000 paid in, according to incorporation papers filed with the Secretary of State.

American-Marietta Co.

At the annual meeting of stockholders of American-Marietta Co., held in Chicago, Ill. on Feb. 5, Grover M. Hermann, president, reported that the company's sales for the 1945 fiscal year were close to $13,500,000. Earnings were $1,217,467.10 before income

Considering Infra Red?

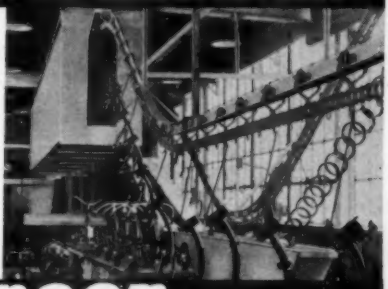
SEE HOW JENSEN SOLVED 4 FINISHING PROBLEMS FOR TRICYCLE MANUFACTURER

PROBLEM I—Limited space. Solved by ceiling mounting both dry off and paint bake ovens.

PROBLEM II—To prevent cleaning solution leaving moisture spots on parts which would show through paint. Solved by 8-foot bank of infra-red lamps.

PROBLEM III—To automatically dip parts to eliminate manual labor operations. Solved by conveyorizing with Jensen loop-around conveyor.

PROBLEM IV—To avoid discoloration. Solved by "nesting" of lamps.



JENSEN SPECIALTIES, Inc. JENSEN 9331 FREELAND DETROIT 27, MICH.

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OLD FRIENDS ARE BEST!
Three generations of wood finishers have used SAN-ITAI-RIE FILLER. It still is best for all defects in wood.
SAN-ITAI-RIE FILLER CO.
DIVISION OF G. J. Liebich Co. CHICAGO 22, ILLINOIS

and excess profits taxes of $853,215.58. Net profits of $364,251.52 are against $316,844.82 for the previous year.

Grover M. Hermann, C. S. Beaver, George LaVallee, and R. L. Oughton were re-elected directors. The officers who have previously served were re-appointed. Kenneth E. Clarke was made a vice president in charge of the Ferbert-Schorndorfer division at Cleveland, Ohio.

American-Marietta's purchase, during 1945, of four companies expanded its manufacturing operations into Canada and the Pacific Coast. Production facilities were also expanded by the construction of new varnish plants at Kansas City and Ottawa, Canada, and a new plant at Chicago Heights for the Keystone Asphalt Products division. Construction of additional buildings at Kankakee, Ill. and Marietta, Ohio, is already underway, and a program of improvement and expansion of all plants is planned during 1946.

American-Marietta is also increasing its distributing facilities and expects to add, during 1946, to the ten distributing units now being operated in key cities.

Izzett Represents Neilson in Chicago

R. Izzett has been appointed Chicago and Illinois representative for the Neilson Chemical Co., Detroit, Mich. Mr. Izzett has many friends in the finishing industry and for the past 12 years was with the Caterpillar Tractor at Peoria, Ill. Mr. Izzett will have his headquarters in Chicago.

R. Izzett is representative for Neilson in Chicago, Illinois.

Maas & Waldstein Adds Two Men in Chicago Area

Maas & Waldstein Co., of Newark, N. J., manufacturer of lacquers, enamels, synthetics and specialty finishes, announces the appointment of C. B. Knepper and C. R. Peterson as sales representatives operating out of the Chicago office. Mr. Knepper will cover a portion of Chicago and the State of Wisconsin, while Mr. Peterson's territory will be another part of Chicago and the State of Michigan.